MODERN
POULTRY MANAGEMENT

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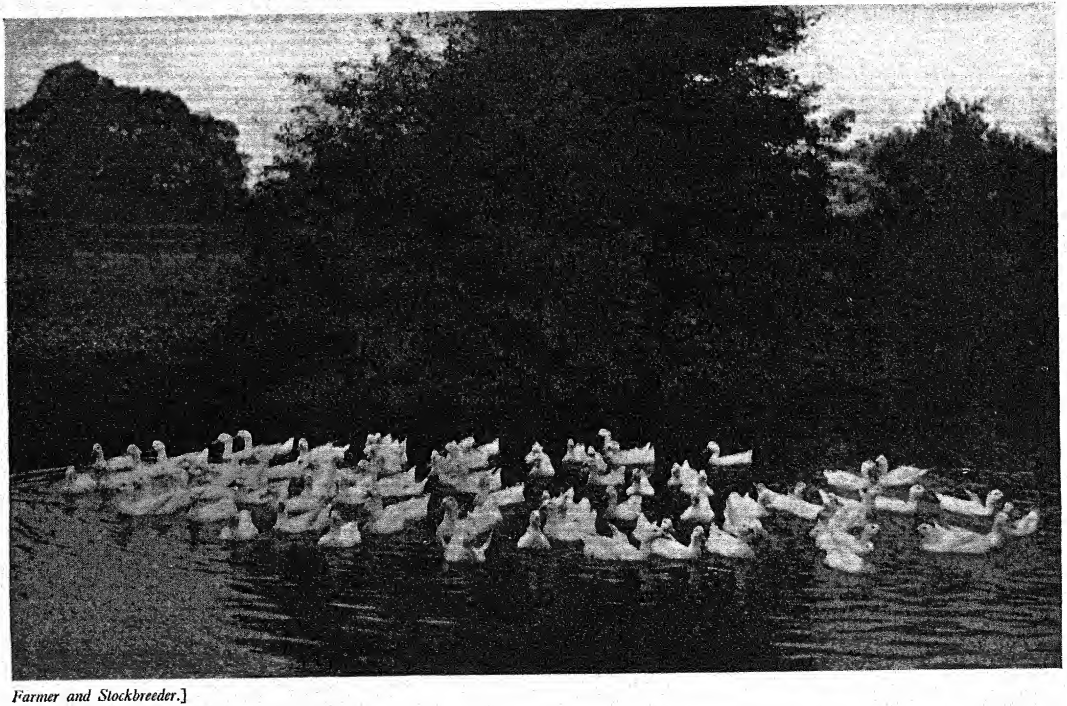

Farmer and Stockbreeder.]

A GROUP OF AYLESBURY BREEDING DUCKS.

MODERN POULTRY MANAGEMENT

BY

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"MANAGEMENT OF FARM POULTRY WITH A VIEW TO PROFIT"

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PREFACE

THOSE who have followed the progress of the poultry industry during the last twenty years have witnessed the great expansion it has made in all its varied branches. At one time it was of small importance in comparison with other branches of agriculture, but the poultry and eggs produced in this country are now nearly of the same value as the cereals (wheat, barley and oats). In 1938 the value of poultry products was £34,628,583, while that of cereals was £36,273,108. In the same year the consumption of poultry and eggs amounted in value to £51,653,799, of which imports accounted for 32·96 per cent., equivalent to £17,025,216.

The import figures suggest that home producers have a great opportunity for expansion without any fear of overstocking the markets. Conditions prevailing in the poultry industry in the past few years, however, have given little encouragement to poultry-keepers to increase their stock, and have not been particularly attractive to newcomers. There does

appear now to be a break in the dark clouds, and if the various schemes recommended by the Poultry Technical Committee for the improvement of the industry are brought into effect, poultry-keepers should again look forward with confidence to a period of greater security and prosperity.

In view of the many difficulties experienced, it is encouraging to note the very large number of general farmers who still show a keen interest in poultry. Some, of course, have had to give up, but others have kept to their poultry through good and bad times, and have come to recognise their importance in general farming practice. When it is remembered that approximately 75 per cent. of the total eggs produced in this country come from general farms, the importance of the farm poultry-keeper is more fully realised.

It would be wrong to assert that large profits can always be made from poultry kept solely for the production of table eggs and chickens. It would be equally wrong to state that there is no money to be made from them. At the present time the profits are smaller than they used to be, just as in many other branches of agriculture. If the poultry-keeper is to be successful, it is essential for him to be thoroughly

acquainted with all the details of his business and to be able to put his knowledge into practice. He must keep abreast with all new developments, and he will find this no easy task when, as during recent years, great changes in methods of housing, feeding and management are taking place.

Many requests have been made from time to time for a low-priced book dealing with modern methods of poultry-keeping which would be of interest and service to farmers, smallholders and backyarders. The aim of this book is to meet this demand. I have endeavoured to cover the most important branches of the industry in as concise a form as possible, at the same time drawing attention to those details on which success so much depends.

In view of the interest taken in rural subjects in ordinary elementary schools, I feel certain that "Modern Poultry Management" will prove of great service to those concerned with the teaching of this subject.

"He who aims at the sky hits higher than he who aims at the tree."

HERBERT HOWES.

April, 1939.

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CHAPTER I

IMPORTANT BRANCHES OF THE INDUSTRY

Egg Production—Table Poultry—Hatching-Egg and Day-old-Chick Trade—Pedigree Breeding

THERE are numerous branches of the poultry industry in which farmers can become engaged. The more important of them are considered in this chapter in a brief manner, whilst the details of the various undertakings are reserved for later chapters.

It is often convenient to combine two or three branches of poultry-keeping, but there is evidence to prove that it pays to specialise. In restricting himself to one branch the poultry-keeper becomes an expert at the job, and in this way often obtains the best results. Later on there may be opportunities for him to deal with other branches, after mastering them one by one in a methodical manner, but sometimes these additions tend to complicate matters and in the end provide less revenue. A good deal depends on the individual concerned. In any case it is advisable to "make haste slowly",

and make sure that the step taken has been well considered.

COMMERCIAL EGG PRODUCTION.—Commercial egg production is the simplest branch of poultry-farming and is one of the most remunerative. There is a demand all the year round for fresh eggs, and preference is often given to the genuine farm egg, produced by healthy stock enjoying free range and living under natural conditions. A steady daily yield provides a regular income throughout the year, and this appeals to most poultry-keepers.

Although it is a straightforward job and can be carried out by any interested person of average intelligence, it is not merely a question of feeding the fowls and collecting the eggs; there is much more in it than that. Elaborate methods of management need not be undertaken, but it is essential to provide suitable houses and foods, and clean land.

In the breeding of the replacements required each year for the general flocks there will be approximately equal numbers of cockerels and pullets. The cockerels can be sold as day-olds for table use, or reared for fattening on the farm or for finishing by the fattener. The profit secured from the cockerels will depend

to some extent on the method of disposal. The finished bird will fetch more than the unfattened chicken, but the additional profit does not always cover the extra cost of production.

In the event of an egg farmer wishing to avoid table-poultry production altogether, he can breed sex-linked chicks or he can have the chicks of his pure breeds sexed at day-old. In both cases the cockerels can be sold within twenty-four hours of hatching. Another plan is to purchase day-old pullet chicks, thereby avoiding breeding altogether. This system is quite common amongst farmers who have no use for cockerels and no inclination to bother with breeding stock. Whilst every possible shilling should be secured from the poultry, it would be a great mistake to retain the cockerels for table if it interfered too much with the general routine.

TABLE POULTRY.—The table-poultry branch of the industry requires more care and attention than is usually given to commercial egg production. There is a great deal to think about and plan, such as regularity of supplies of chicks, brooding, rearing, fattening, marketing, and a host of other matters which tend to make this branch more complicated. Constant supplies of good-quality table birds are re-

quired, and if they are to realise the best prices they must be properly fattened and marketed. All this calls for regular hatching or the provision of chicks from outside sources.

When the production of table poultry forms only a part of the business of the poultry farm, the finishing process is often left to fatteners, to whom the chickens are sold when they have finished rearing. This is sometimes the case with surplus cockerel chicks produced on the egg farm, for this forms a profitable outlet for these birds.

HATCHING EGGS AND DAY-OLD CHICKS.—The production of first-class hatching eggs is a specially suitable undertaking for farm poultry-keepers, and can be carried out in conjunction with the production of the table egg. There is a very great demand for good-quality eggs from both pure and first-cross matings of stock free from disease and enjoying extensive range. In the past there has been some difficulty in getting this class of egg. It is not enough to place a few males amongst the laying birds. It involves careful selection, mating and personal supervision of pens set aside for the purpose, and it is necessary to arrange for the provision of suitable breeding males and the blood-testing of all stock. Quality must be

kept right in the foreground. There is nothing formidable in the task; plain common sense and a love for the work will win through. The price paid for good hatching eggs of popular breeds should compensate for any extra labour or expense involved. The season usually commences in the late autumn and continues through the spring. Surplus eggs from the mated stock can be sold through the ordinary channels.

Closely linked with this branch is the day-old chick trade. Although as a main business it is a line for specialists, I see no reason why it should not be attempted on a small scale by keen poultry-keepers in order to supply local needs. Providing orders are secured well in advance, arrangements can be made for producing sufficient eggs to fulfil the orders and meet the requirements of the farm. It is too risky to produce surplus chicks on the off-chance of disposing of them, but if this is done one must be prepared to advertise and cater specially for the needs of customers.

There is an increasing demand for growing pullets varying in age from eight weeks to four months, and here is another opportunity to develop a paying sideline. Many thousands of pullets are disposed of annually to large and

small poultry-keepers who have not the facilities for rearing them during the early weeks. Additional chickens can be produced in each of the various hatches for this trade.

PEDIGREE BREEDING.—This work can be undertaken by farmers and others who have the necessary land and facilities for carrying it out, but it calls for a special knowledge of breeding methods and a capacity for detailed work, such as trap-nesting, recording and pedigreeing. In short, it is a job for the expert only, and must be done properly from start to finish. Before attempting this work it is advisable to obtain a good experience in commercial production and breeding, which will provide much information of a helpful character, especially when efforts are made to improve quality by selection and culling. It should be remembered that quality counts much more than quantity, for the pedigree breeder must depend on his reputation for his ultimate success.

I have dealt briefly with the various branches of the industry, and it will be clear from what I have said that in my opinion commercial egg production is the safest for the novice. The risks are not great, capital expenditure can be kept reasonably low, and there is a

ready sale for the produce. A sample of eggs of standard size and quality such as can be produced by most poultry-keepers will realise the market prices prevailing at the time of sale. In most of the other sidelines there are many factors which influence prices. Table chickens, for example, have no fixed price, their value depending on quality of flesh, condition, method of marketing and demand for birds at time of marketing.

Chapter 2

UP-TO-DATE METHODS OF POULTRY-KEEPING

Free Range—Fold—Semi-Intensive—Intensive and Battery Methods—Various Types of Houses best suited for the Several Methods

In days gone by there was little choice as to the system of poultry-keeping, and on general farms it was assumed that the one and only right method was free range. Today things have changed, and there is a choice of half a dozen different methods for the production of the commercial egg; but when consideration is given to the breeding side of the business, then the choice is somewhat limited.

It would be unwise to recommend any particular system as being the best, because so much depends on circumstances and on the objects in view. For example, one would hardly expect the farmer to adopt the intensive system, or the person with limited acreage to follow the fold method. Although the system adopted plays an important part in successful poultry-keeping, it must be understood that

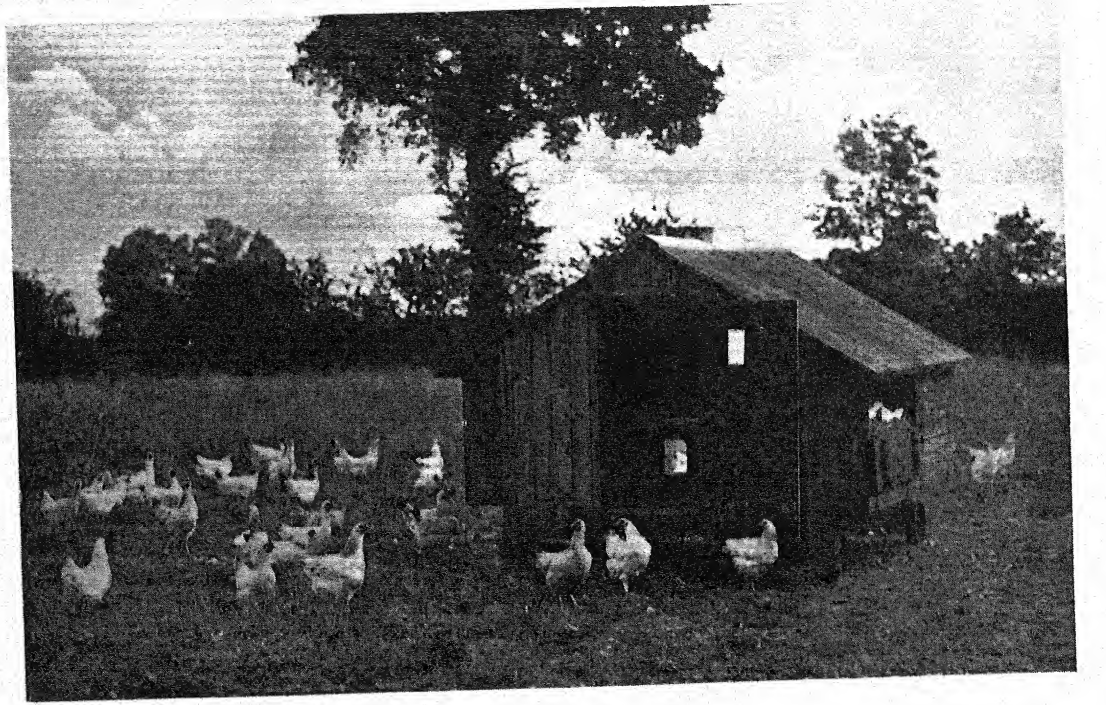
there are many other factors on which success depends, and it is the right combination which scores in the long run. Quite often it is stated that a certain poultry-keeper failed because the system was wrong. Investigation of the matter would probably bring to light a variety of causes, amongst them, perhaps, the fact that the system adopted was not the best suited to the circumstances, or that mistakes had been made in applying a suitable method.

FREE RANGE.—Without any hesitation I would suggest free range for the farmer, and I cannot imagine anyone with a moderate acreage excluding this method. This need not prevent him from using in addition the hen battery system; in fact, I am going to suggest that this be given a trial. At the same time the majority of the farmer's birds should be enjoying free range. Unfortunately there are certain disadvantages, and where foxes and other vermin are troublesome it is hazardous to allow the flock its freedom. Losses can be exceptionally heavy, and the compensation offered is too meagre to warrant any risks. It is probable that the winter egg yield will be lower from birds kept in open-range houses than from those kept in a semi-intensive type of house, but over the full year there will not

be very much difference in the yields. A good deal can be done to encourage production on range by careful management.

Providing suitable houses are used, the birds can enjoy access to fresh land whenever the poultry-keeper is prepared to grant it. At certain periods of the year it should be possible to utilise the stubbles and so help to reduce the cost of feeding. During the winter months it may be desirable to arrange the houses so that they are sheltered by woods. It should be remembered that there is a great saving in capital outlay, due to the fact that wire-netting boundary fences are not required.

FOLD METHOD.—During the past few years this system has come to the front, and is now very popular amongst general farmers. It has enabled poultry-keepers who have been forced to retire because of the fox menace to return to the "fold", and in a great many cases results have surpassed those obtained from birds kept on free range. The system calls for a special type of house, regular moving to fresh ground, and careful management. From twenty-five to thirty birds are kept in one house and run, the whole structure measuring 20 by 6 feet. Poultry kept under these conditions greatly improve the herbage, especially



Farmer and Stockbreeder.]

SLATTED-FLOOR HOUSE FOR LAYING STOCK.

on poor pastures. It is quite common to find from one to three thousand birds kept in this manner in areas where Reynard roams about. Winter egg yields are well up to the average, and, if care is taken, egg-eating and cannibalism, two of the chief troubles, may be avoided.

SEMI-INTENSIVE METHOD.—This system is favoured on small holdings and commercial plants where land is limited. Flocks varying from fifty to one hundred birds are often kept, but the size of unit depends on the housing arrangements. Whenever possible, portable houses should be utilised, in order to avoid stale land. Additional costs have to be met, because it is essential to erect fencing to curtail the activities of the various units. Overstocking must be avoided and every precaution taken to prevent disease. If suitable houses are used, the winter egg yield should be higher than from stock kept on free range.

INTENSIVE METHOD.—This system should appeal to those with very limited space or where the land has become foul through overcrowding or continuous use. Farmers are not advised to adopt it, although I have seen excellent results from birds kept intensively during the winter months. I feel certain, how-

ever, that smallholders and backyarders would prefer it to the old-fashioned system, which resulted in stale and muddy plots and bad sanitation. Fixed types of houses are advisable, and flocks of fifty to one hundred birds are recommended. With larger groups feather-plucking and cannibalism are likely to develop.

BATTERY METHOD.—This is the most recent innovation for commercial egg production, and, in spite of strong opposition from some quarters, it is gradually gaining ground amongst farmers and smaller poultry-keepers. Here and there battery-houses holding a thousand birds are to be found, and flocks up to five thousand head are kept solely in this way. In the early days there were doubts as to the advisability of keeping hens in such confined spaces, but results seem to indicate that it is not detrimental. Under careful management good egg production may be expected, equal to that obtained from birds kept on range.

In order to secure satisfactory results it is essential to have well-bred, healthy stock; culls from the farm flocks are not recommended. It is true that backward pullets often thrive and develop into good layers, but this naturally depends on the quality of such birds. There is

certainly a tendency for them to develop rapidly after they have been put in cages, and frequently they come into lay at five months.

It has been said that eggs produced in a battery are inferior in quality to those laid by birds on range, but there is no evidence to this effect. The chief thing is to provide a ration which will satisfy the bird's requirements from the point of view of egg production and health.

I am of the opinion that the system will attract more poultry-keepers. Already most of the poultry educational institutions have made provision for demonstration plants varying from one hundred to a thousand birds. It remains to be seen whether general farmers will join the ranks; a few are giving it a trial, and results appear to be satisfactory.

TYPES OF HOUSES.—It should be recognised that every system of poultry-keeping calls for its own particular type of house, and this fact must be borne in mind if good results are to be secured. Poultry-keeping would be a much easier and pleasanter task if everything could be standardised, but this can only be done in certain directions. Correct housing is very important; in fact, it is essential. In all cases the houses should be well built with seasoned

timber. Houses shoddily made are a liability from the start, and the troubles which follow their use often break the heart of the enthusiast. It is doubtful whether it pays the poultry-keeper to make his own houses. Wood and other oddments may be obtained at wholesale rates, but with additional labour expenditure there is little or nothing to justify the effort. A watch should be kept on local sales, as sometimes there are opportunities to pick up good bargains. Anything purchased must be thoroughly cleansed and creosoted before using. In the event of one requiring a house embodying a special feature, it may be possible to arrange for a local tradesman to manufacture it. In any case it is a wise policy to get quotations from local firms, because makers at a long distance have to provide for carriage and other incidental expenses in their prices.

The most important points to remember when providing housing accommodation are workmanship, space, light and ventilation. Let us consider them in this order. Workmanship means quality of work. I have already suggested that shoddily built houses should be avoided, and when making this remark I meant that poor-quality houses suggest bad

workmanship, including inferior materials, badly fitting doors and windows. A good house will mean a greater outlay, but it will last twice as long and cost little for repairs.

Space is an important factor, and it must meet the needs of the birds. If space is inadequate there is overcrowding, and this eventually leads to colds and other troubles. Floor space governs the number of birds that can be safely put into a house, each system demanding a minimum area per bird, together with perching and nesting room.

Light must not be overlooked, because of its importance to health and production. In order to provide the maximum of sunlight, windows should be provided at all convenient parts of the house. Unlighted houses are likely to harbour insect pests and disease germs, both of which are harmful to the fowls. It has been proved that egg production is greater from birds kept in well-lighted houses than from similar groups housed in darker structures during the winter months.

Ventilation is closely associated with light and is just as essential. In all cases it should be possible to control the ventilation. The safest method is to ventilate above the birds, taking care to avoid draughts. The actual

amount of ventilating space should meet the requirements of the flock likely to use the house: the bigger the number of birds, the more ventilation is required. Ventilation can be overdone, but if properly regulated there is little risk of trouble from colds. At no period of the day or night should the inside atmosphere appear "stuffy", and when the birds are released in the morning there should be no unpleasant odour in the house.

Now let us consider the most suitable types of houses for the various systems of poultry-keeping. For free range portable houses are preferable, and either the slatted-floor type or the old-fashioned colony house is suitable. Slatted-floor houses have been in use for several years, and have given satisfaction in most districts. In the more modern houses space is provided inside for nests, food and water vessels. The floor area needed is 1 square foot per bird, so that a house measuring 10 by 10 feet is suitable for one hundred birds. In a colony house each bird should be allowed 2 square feet of floor space. The housing cost for the slatted-floor type is approximately four shillings, and for a colony house not less than six shillings per bird.

If larger flocks are favoured, the movable

house must give way to a permanent structure, and the choice rests between the full span, three-quarter span, two-thirds span, and the older type, rarely seen these days, the "lean-to". Every bird should be allowed 9 inches of perching space, and one nest should be provided for every four birds. In order to facilitate working arrangements, all interior fittings should be movable and of standard size. The floor space should be 3 square feet per bird, so that a house measuring 20 by 15 feet will provide sufficient room for one hundred birds. The cost of housing is in the region of six shillings per bird. When fixed houses are used in fields, it is advisable to keep cattle from them, and this calls for a strong fence all round the house, about 4 feet away.

For semi-intensive and intensive methods the same type of house can be used, both for large flocks of one hundred birds and also for smaller groups. The same floor space is allowed in semi-intensive houses as when the birds are on range, but flocks kept intensively need 4 square feet per bird, plus all the other requirements of large-range flocks. All permanent houses should be mounted on a good foundation, the floor being at least 1 foot above ground-level. Small-mesh wire-netting, let into

the ground about 18 inches and nailed to the house about 6 inches above floor-level, will keep rats from burrowing underneath. On farms where large numbers of units are kept it is a good plan to have a portable food store, large enough to hold a fortnight's supply.

The house recommended for the folding system is different from the ordinary types, the house and run being embodied in one structure. There are several styles on the market, and each possesses some special feature. Before deciding on any particular design it is advisable to see some in use, and the County Poultry Instructor will be able to give information as to where folding units can be seen. The cost of housing under this method is approximately four shillings and sixpence per bird. There are a few points to bear in mind at the time of purchase. Houses should be strongly built, but material should not be too heavy or there will be some difficulty in moving to fresh ground daily. The combined roosting and laying quarters, measuring 5 by 5 feet, should occupy about a quarter of the whole space, and this section can be at one end or in the centre. I prefer the centre, because there seems to be less strain on the house and it is much more easily moved. At the opposite end

to the roosting quarters sufficient space for broody coop, food hoppers and drinking vessels should be provided. If this system is adopted in exposed areas, it is advisable to use a fold which gives good protection to the birds.

In connection with the battery system it is important to provide suitable houses to hold the cages. Sometimes a disused farm building can be altered to meet the requirements. Light, ventilation and space are the chief factors to keep in mind, and there must be an even distribution of light over the whole room. A house measuring 35 feet long by 16 feet wide, with span roof, is large enough for four hundred and eighty birds, and the cost is about five shillings per bird. In addition, the cages cost from four to five shillings each. It will be noticed that this system is more costly than any of the others described.

Chapter 3

BREEDS AND CROSSES FOR GENERAL POULTRY-KEEPERS AND BACKYARDERS

Pure Breeds—First Crosses—Table Breeds—Selection and Mating—Time to Hatch—Breeding for Egg Production and Table

In order to make a success of any branch of poultry-keeping, it is important to keep the right breeds, as many of those listed are useless. Some of the fancy breeds may have served their purpose years ago, but for present-day utility purposes they are unsatisfactory, although some are still kept for their beauty.

It will generally pay poultry-keepers to concentrate on popular breeds, for as a rule a breed is popular because it has proved its worth in respect of egg production, table poultry, or both. Certain varieties are suitable for the production of both eggs and table poultry, and for the egg-producer who wishes to rear cockerels for table these dual-purpose breeds are ideal. Their production is very satisfactory and is frequently as good as the yield from egg breeds, while the cockerels

make excellent table birds. A further advantage is the brown colour of the eggs, which is insisted upon by some purchasers.

Egg breeds, noted more for their laying than for any table qualities they may possess, are usually of the non-sitting type. Some poultry-keepers who make a speciality of commercial egg production undoubtedly prefer this class. I am of the opinion, however, that the dual-purpose fowl is more valuable to the poultry-keeper.

PURE BREEDS.—I am confining the choice of pure breeds to a limited number whose qualities are sufficient for the needs of the average poultry-keeper. Statistics clearly prove that there is very little difference in the actual production of dual-purpose fowl and breeds noted for their egg laying. The results for half a dozen breeds or varieties which competed in one of the leading egg-laying trials illustrate this point. The average production for forty-eight weeks was as follows:

Black Leghorns . .	196·4 eggs
Rhode Island Reds . .	193·4 „
White Leghorns . .	193·0 „
White Wyandottes . .	189·3 „
Buff Rocks . . .	180·8 „
Light Sussex . . .	171·0 „

It will be seen that there is very little difference in the averages of the first four, of which the Leghorns are recognised as egg-producers, while the other two are dual-purpose breeds.

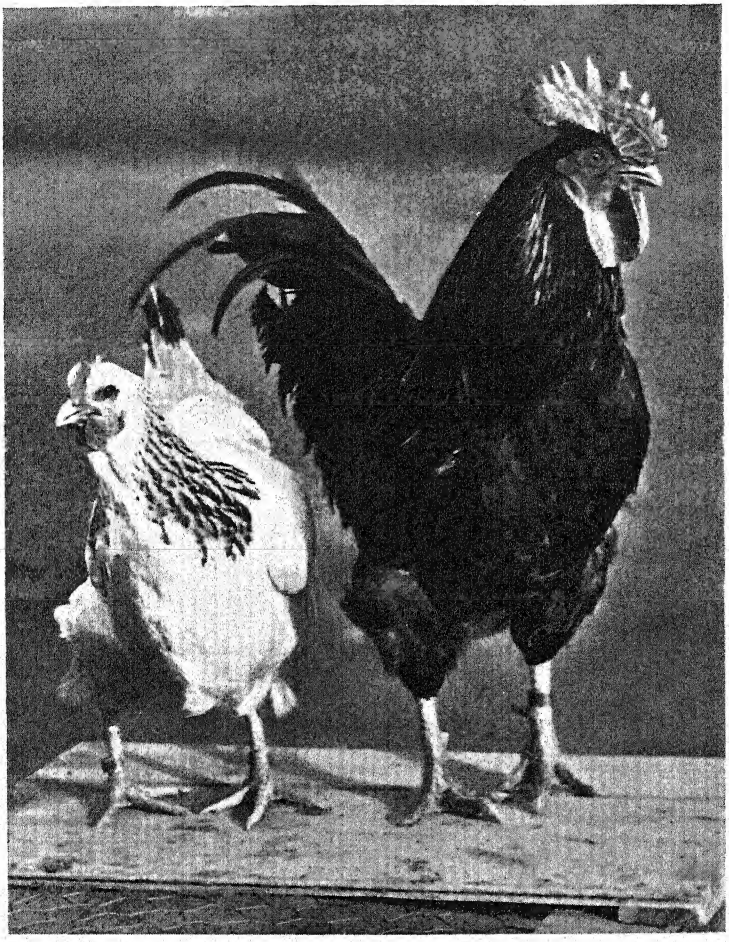
As regards the Rhode Island Red, this breed has proved its worth many times in large and small flocks. It seems just as much at home in the backyard as on range, and for general utility purposes it is difficult to surpass.

Regarding White Wyandottes, this hardy and wonderful winter egg-layer is coming to the fore again, and there is no difficulty in securing reliable stock.

Buff Rocks are regarded as dual-purpose fowls, and, although their egg production is somewhat lower than that of the first four breeds, they are hardy and well suited to exposed situations.

The Light Sussex has the lowest average, but it is important to remember that this breed was originally, and still is, one of the best table breeds. Only within recent years have attempts been made to develop its laying qualities.

First Crosses.—The question is often raised as to whether more profit can be made from pure breeds than from first crosses. Here,



Farmer and Stockbreeder.]

RHODE ISLAND RED MALE AND LIGHT SUSSEX HEN, FOR SEX-LINKAGE.

again, it depends very much on the poultry-keeper's plans. Many first crosses lay as many eggs as pure-bred stock, and in cases where commercial egg production is the only "iron in the fire" I would have no hesitation in recommending a cross. It is largely a matter of choosing suitable varieties and paying attention to strain. There are good and bad strains in every breed, and if one is unfortunate enough to obtain the wrong blood the progeny from such matings will not be worth very much.

When it is decided to use cross-bred stock, and particularly if the disposal of cockerels is at all difficult, the question of introducing a sex-linked cross might well be considered. If strain is studied at time of selection the results should prove satisfactory.

As a rule the backyard poultry-keeper has only a limited amount of space, and this compels him to keep his birds confined. These circumstances suggest a light breed or first cross, but heavy breeds like Wyandottes and Rhodes also do well. Activity is an essential factor in the backyard fowl, and this is where the light breeds score.

For the hen battery heavy breeds are preferred, the others having a tendency to become

flighty and restless in the cages. Experience has shown that either pure heavy breeds or the progeny from matings of light and heavy fowl are best, but pullets from two heavy breeds will also give good results. It is not advisable to mate first-cross stock, as such a practice would result in the production of mongrels of doubtful quality.

TABLE BREEDS.—With reference to the table side of the industry, it is just as important to select suitable breeds, and in fact I am inclined to advise greater care. The general conformation of the carcase will, to a large extent, be influenced by the breed. In many cases a first-cross chicken will make as much profit as a pure-bred bird. As a rule growth is more rapid, and the condition of the bird at the end of the fattening period suggests that the cross-bred is equal, if not superior, to the pure-bred. There is an opportunity to use some of the crosses recommended for egg production, but other crosses are also suggested. For example, there is the Indian Game × Light Sussex, an ideal mating for the production of heavy, good-quality chickens, but having the disadvantage of low fertility. Another favourite mating is the half-bred Game Sussex male to Sussex hens, this being favoured

because there is less difficulty in securing good fertility in the early part of the season.

Although it seems absurd to stress the point, one must study the needs of the consumer and produce chickens to suit the market. This can be accomplished quite easily, but the desire

LIST OF BREEDS AND CROSSES RECOMMENDED FOR THE VARIOUS BRANCHES OF POULTRY-KEEPING.

Sex-linked crosses starred (*).

Purpose.	*Breeds.*	*Crosses.*
Egg production	White Leghorns Black Leghorns Anconas Black Minorcas Welsummers	White Leghorn × White Wyandotte Black Leghorn × Rhode Island Red White Leghorn × Rhode Island Red White Leghorn × Light Sussex Welsummer × Rhode Island Red *Welsummer × White Wyandotte *Brown Leghorn × Light Sussex *Buff Leghorn × Light Sussex *Buff Leghorn × White Wyandotte *Brown Leghorn × White Wyandotte *Black Leghorn × Barred Rock
Table poultry	Light Sussex White Sussex Salmon Faverolles Indian Game Old English Game	Light Sussex × Rhode Island Red Light Sussex × White Wyandotte *Indian Game × Light Sussex *Indian Game × Faverolles Old English Game × Light Sussex
Dual purpose	Rhode Island Reds White Wyandottes Buff Rocks Light Sussex	Light Sussex × Rhode Island Red *Rhode Island Red × Light Sussex *Rhode Island Red × White Sussex *Rhode Island Red × White Wyandotte *Buff Rock × White Wyandotte *Buff Rock × Light Sussex

for special qualities limits the choice to certain breeds and crosses. As regards the quality of either yellow- or white-fleshed birds, personally I do not think there is any difference at all. It is admitted that feeding has a controlling influence over the quality and texture of the flesh.

SELECTION OF STOCK.—However good the breeds and crosses may be, success will not be achieved unless the greatest care is taken in the selection and mating of the breeding stock. Good birds improperly mated will result in the production of inferior progeny. Whatever the object of the poultry-keeper may be, there are certain factors which cannot be ignored. All prospective breeding stock must be healthy; the inclusion of one unhealthy specimen may easily cause a lot of trouble and spoil the hatching season. Health can be determined by inspection, special attention being directed to weight, body condition and eye colour. All birds should be handled before they are admitted to the breeding pen.

Birds used for breeding should possess all the good qualities of the breed. Body size is important; the small-bodied bird, even if she is a first-class layer, is not suitable for breeding purposes, any more than the extra-large coarse

specimen. Quality counts and must be kept well in the foreground. All breeding birds should possess good width and length of back, full chest, plenty of width between the legs, soft abdomen, straight pelvic bones and large vent. Eye colour should be as demanded by the standard, and any fault in the structure of the eye looked upon with suspicion. Attention should be paid to head points, as these are a help in picking out the best layers, good-textured combs being associated with laying qualities. Then there are deformities, such as crooked breast-bones, crooked toes, poor tail carriage and other minor defects, all of which are detrimental from a breeding standpoint and should not be encouraged. Like begets like in such cases, and since we know that a large proportion of the progeny will be affected it is advisable to fix a high standard.

In making provision for the breeding stock a difficulty arises in deciding whether hens or pullets, or both, shall be used in the pens. This is a debatable point. My own opinion is that whenever possible yearling or older hens should be used, because these birds are mature and have proved that they are capable of living and laying. There is no proof beyond the early autumn records of the value of a

pullet at the time when she is needed for breeding. For the purpose of obtaining future breeding stock mature hens should be used in all cases. I am not prepared to recommend that pullets should be excluded altogether from the breeding pen. There is no objection to using healthy, well-matured birds for breeding commercial layers; it has been done many times with good results. I do object, however, to the use of late-hatched immature birds for this purpose, because such matings will not produce good stock. When there are insufficient over-year birds available for breeding purposes the number should be made up from the earliest-hatched pullets which have laid during the summer and moulted in the autumn.

MATING.—With reference to mating, this must be considered a very important phase of breeding. Whenever possible, use males which have been bred from hens mated to tested males, parents which have already proved their value as breeders. The male is nine-tenths of the pen, and he influences the whole of the progeny. A poor-quality male in a pen of good hens will only produce mediocre stock.

Well-matured current year's males are the

most reliable for early chicken production. Yearling males can also be used with choice hens or pullets, and anyone who has an "old stager", which has proved its worth as a getter of good stock, should not be afraid to use him. In choosing the males it is important to see that they are healthy and well matured. Size is essential, but one can sacrifice this factor a little if the females are well developed. Breed characteristics should be up to standard, and long, straight breasts and broad backs should be well in evidence. A healthy male should carry plenty of breast meat, and if there is any tendency in the other direction it is better not to risk using such a bird.

Methods of Mating.—There are various systems of mating open to the poultry-keeper, and the actual method employed will depend on the object in view. In cases where one is concerned with the production of pullets for commercial egg production, mass or flock mating can be practised successfully. It consists of running a number of males with selected groups of females, at the rate of one male with ten to fifteen females according to breed. Vigorous cockerels can be mated to double the number of females suggested, and in some cases with excellent results, but it is better not

to take risks when good fertility is desired and when eggs are scarce and dear.

Whenever possible, males for mass mating should be full brothers or be obtained from one source, in order to make certain of the line of blood. If the males are secured from various sources fighting will follow, and this will ruin the chances of getting good fertility. In this case it is better to have two distinct groups of males, using one group for a fortnight and then changing over to the other group. In this way both lots get a rest and fertility is maintained at a high level. The greatest objection to mass mating is that it is impossible to trace the results of any individual male.

Single Male Mating.—The single male mating is a common practice on small farms and also amongst pedigree breeders, the custom being to run one male with from ten to fifteen females. Sometimes an exceptionally good male is purchased with a view to securing a different line of blood. In order to make the best use of him he should be allowed to run with two pens of birds, changing daily from one pen to the other all through the season. He should be moved into a coop each night, and given a good feed of mash every morning before he is released.

In this way his body condition is maintained, his breeding qualities are preserved, and his cost spread over a larger number of chickens.

Old males should have their spurs removed before mating, by cutting off the ends with a sharp instrument and applying caustic. Dubbing of heavy-combed breeds is also advised, particularly old males with heavy overhanging combs. The comb blocks the eyesight, preventing the bird from finding his food and mating with the hens. The method of removal is simple, a pair of sharp scissors and the caustic stick being the chief requirements. The comb and the wattles are cut off near to the head, and after washing under the cold-water tap for a minute or so, the cuts are smeared with caustic. In about a week the bird is again full of vigour, with fertility above the average.

Time to Mate.—Male birds should be selected well in advance, and when they are purchased they should be brought to the farm at least a month before they are required for mating. It is advisable to buy all birds on approval, and to secure at the time of purchase full particulars of pedigree, method of feeding, and peculiarities of the strain. If the birds are not free from lice, a drop or two of nicotine sulphate should be applied to the feathers around the

vent. The males should be introduced at least a month before eggs are needed for hatching, and a note made to this effect. Eggs may be fertilised within a week of mating, but it is better to allow a little more time. When introducing another male for a definite purpose, it is advisable to allow a fortnight after the change before eggs are saved. At the end of the hatching season the males should be removed and sold, unless there is a desire to retain any for future breeding. Sometimes a male will refuse to mate with some particular female, and rather than lose her eggs through the season she should be removed to another pen.

TIME TO HATCH.—During the past few years the hatching period has altered a good deal, with the result that large numbers of chickens are produced out of what is regarded as the normal season. On many farms hatching commences in October and continues till April, but this method should be carried out only when hen batteries are used, or when one is concerned with large-scale production. For general purposes the best hatching months are from January to April, care being taken to get the heavy breeds out by the end of March and light breeds by the end of April. It pays better

to hatch early than late, because the pullets lay well during the summer and the cockerels make good prices in the spring. It is as well to decide on the number of chickens required and then arrange the hatching period accordingly.

BREEDING FOR EGG PRODUCTION.—When mating stock for the purpose of producing layers, it is necessary to have good qualities on both sides. The foundation stock should be typical of the breed, be of good size and shape, produce good-sized eggs of the right colour and texture, and be capable of laying well. From a large flock it should be possible to select a dozen first-class birds for mating to a pedigree male. The following autumn the very best of the resulting pullets should be chosen and mated to their sire, the hens being retained for mating with one of the sons. Each year there must be an effort to choose the best birds for breeding purposes, and the males must come from reliable stock bred for egg-laying qualities. It will, of course, prove a great advantage if the pullets can be trap-nested, but very few farmers are able to do this, and the only alternative is careful observation and handling.

BREEDING FOR TABLE.—In this case eggs are not the all-important factor, but if good table

chickens are to be produced the quality of the egg counts. The females used in the breeding pens should be capable of laying well during the winter period. The chief points to remember in mating for table are quality and colour of flesh, size or weight of bird, and rate of maturity. The trade one is cultivating will determine the quality and size of the chicken.

Yearling hens are advised, mated to vigorous young males, but very often they fail to lay in the late autumn, and there is no alternative but to use early-hatched pullets. The best chickens are obtained from hen eggs weighing from 2 to $2\frac{1}{4}$ ounces. Eggs weighing less than 2 ounces should not be used.

So far no mention has been made of blood-testing the breeding stock, but it ought to be done. I am a believer in blood-testing, and would not think of using stock which had not passed the test. If anxious to apply the test, the poultry-keeper should get in touch with his County Poultry Instructor and ask for the address of a reliable veterinary pathologist. The charge for testing varies a little, but the average fee is about three halfpence per sample. The veterinary surgeon supplying the blood tubes usually provides instructions for taking the samples, packing and despatching.

CHAPTER 4

GENERAL MANAGEMENT OF STOCK FOR LAYING AND BREEDING PURPOSES

Housing—Breeding Stock—Artificial Lighting—Forced Moulting—Rations—Systems of Feeding—Size and Care of Runs—Care of Appliances

EXPERT poultry-keepers realise that management plays an important part in the production of eggs, especially during the winter period. One can provide the best housing accommodation and keep a suitable breed and still fail if the management is faulty, for it must be remembered that the birds rely on the poultryman to supply them with the necessary food and some of the other essentials which help to keep them healthy and in good body condition. If any important ingredient is left out of the ration or the method of management is wrong, the flock is certain to suffer.

Management covers a wide field of activities, such as housing, feeding and general routine duties. Some of the latter are apt to become rather monotonous, but they have to be attended to; and those who are prepared to give

the necessary time and attention to the small details usually score over those who do just the bare minimum. There is ample proof that poultry respond to good treatment, and unless the prospective poultry-keeper is prepared to supply their requirements they will show a loss. There is no need to fuss over them; it cannot be done on a commercial farm, but the backyarder may be able to devote more time to his flock because, in a sense, it is his hobby.

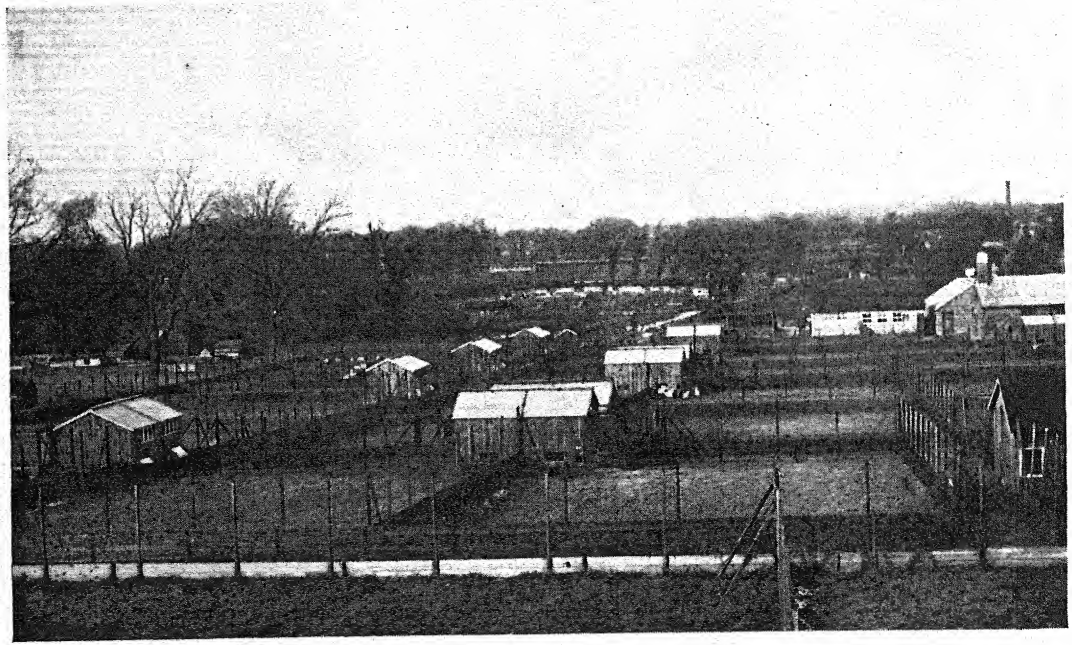
Regular attention and the careful planning of the work will help towards success. Certain jobs have to be done daily at definite hours, whilst others can be left over to a more convenient time. Such work as egg washing, grading and packing can be done after dark, together with egg testing and general incubation duties.

Let us first of all deal with the important work relating to the management of commercial flocks. Assuming that the poultry-keeper has made plans to house a definite number of pullets, they have to be brought into their respective houses, and a different routine has to be introduced. The actual selection of the birds is dealt with in a later chapter.

HOUSING.—On farms where the birds are

housed in open fields it is important to see that they are protected against bad weather conditions. In exposed areas it may be necessary to provide some form of shelter as a protection against wind and sun, and there is nothing to equal the wooden type of sheep-hurdle covered with straw and placed around the windward side of the house. Poultry dislike wind and often prefer to remain inside rather than face the biting blast of a wintry day. When the houses are provided with solid floors it is necessary to replenish the litter fairly frequently during the winter months. The manure from all types of houses should be removed at least once a week. This does not necessarily mean the removal of the floor litter, but as soon as it shows signs of becoming foul it should be renewed. The best litter for floors is peat-moss tailings, or a mixture of peat and sawdust; this mixture absorbs a certain amount of moisture and makes a useful manure, especially for horticultural purposes. Farmers would probably prefer chaff of some sort or other, but it is a very poor absorbent and soon becomes foul unless mixed with peat-moss. Poultry manure must be carefully stored and protected from the weather until required for use.

Interior Details.—It is important to spray all houses periodically with some form of disinfectant as a precaution against disease and insect pests. This is additional to the annual "spring clean", which should take place before fresh groups of pullets are placed in the houses. A coating of limewash should be applied not less than twice a year; this will lighten the interior and encourage production. Limewash is excellent as a disinfectant, but useless for killing insects. In the event of any part of the interior being overrun with red mite, a dressing of creosote should be given, or a mixture of one part creosote to three parts paraffin. The perches, supporting-brackets and dropping-boards often harbour pests, and should also receive a periodical dressing. Nest-boxes should be kept clean and well littered with soft material, such as meadow hay. Sometimes there is a tendency for odd birds to roost inside them, resulting in foul nests and dirty eggs. When the pullets are first placed in their respective houses they should be prevented from roosting in the nest-boxes at night by covering the fronts with sacks. It is also important to see that all birds perch, and a few visits to the house at dusk to put the birds on the perches will soon teach them the right habit.



Farmer and Stockbreeder.]

A RANGE OF BREEDING PENS WITH PROTECTED RUNS.

BREEDING STOCK.—The actual routine work in connection with the breeding stock need not differ very much from that of the layers. Cleanliness is most important, and efforts must be made to avoid overfeeding. Insect pests must be kept at bay, and it may be necessary to apply nicotine sulphate to the birds and perches periodically. An examination of all breeding stock should be made occasionally in order to find out the body condition of the birds. It is very desirable to keep a watch on the male birds, and to make sure that they are getting plenty of food. Infertility should act as a warning that something is wrong with the stock, and an inspection will probably reveal the cause.

ARTIFICIAL LIGHTING OF HOUSES.—It has been proved many times that poultry respond to artificial light, and many commercial poultry-keepers light up their houses during the winter months. It is difficult to light small unit houses on range, but the larger types can be dealt with fairly easily. By adding to the hours of daylight, extra eggs can be secured when prices are high, but the total yield at the end of the laying year is about the same as that from unlighted houses. There are various methods of lighting, most of which give good

results. Morning or evening lights can be used, but it is cheaper to provide morning lights because there is no need to install costly dimming devices.

FORCED MOULTING.—I have assumed that the laying stock consists of pullets, which are replaced at the end of their laying year by young stock. Although this method is the most profitable from the standpoint of egg production, some poultry-keepers prefer to keep a number of yearlings each season, in addition to those reserved for breeding. On some farms it is customary to keep about 75 per cent. pullets and 25 per cent. hens, but it is preferable to keep the former for commercial egg production and the yearlings for the breeding pens. Pullets are far more reliable than hens for winter laying. When hens are kept for commercial egg production it is advisable to force-moult them in the autumn in readiness for egg laying later. This is accomplished in the following manner. About the middle of August all mash should be withheld from the birds, their only food being the usual grain allowance. After about two weeks of this treatment egg production will have fallen considerably. There will probably be a few birds which will continue to lay, but the

majority will respond to this treatment. A good deal will depend on the body condition of the birds at the time of restricting the food, and occasionally it will be necessary to continue for an extra week. Approximately three weeks from the commencement of the treatment there should be a gradual return to normal methods of feeding, and by the end of September the majority of the birds should again be in laying condition. In such cases artificial lighting pays, as the birds need stimulating. The force-moulting of breeding stock is not advised, but it may be necessary in certain cases when table chicks are needed in early autumn.

Another method of force-moulting which sometimes scores over the system already described is to withhold all ordinary food for about a fortnight and feed dry bran *ad lib.* in hoppers instead. The change will usually bring on the moult, and after a good start has been made the ordinary rations can be resumed.

RATIONS.—Before adopting any method of feeding it is advisable to understand something of the fowl's requirements. With this information it will be easier to make up a suitable ration. Mistakes in feeding are still

quite common, but there has been much improvement during the last few years, resulting in better egg yields at all seasons. Laying stock need plenty of well-balanced food of good quality, fed at regular intervals during the day. It is necessary to embody in any mixture correct proportions of protein, carbohydrates, fats and fibre. All these constituents are available in common foodstuffs such as the following: weatings, bran, maize meal, barley meal, Sussex ground oats, extracted soya bean meal, alfalfa meal, fish meal, meat meal, dried skim milk, wheat, oats, barley and maize. Other foods are available, but there is no need to go outside this list for general use. It is advisable to become acquainted with the analysis of the various foods in order to make certain that the ration is well balanced.

Many poultry-keepers now purchase proprietary mixtures, and there is no doubt that this is a sound method. The food firms catering for the trade employ experts who make a special study of the fowl's requirements, as a result of which they are able to place well-balanced mixtures on the market. Those who prefer to mix their own rations will be able to obtain some guidance from the following mixtures, in which the parts are by weight:

MASH FOR COMMERCIAL EGG FLOCK FROM OCTOBER TO MARCH.

	Parts.
Weatings	4
Bran	2
Maize meal	3
White fish meal	1

MASH FOR SAME FLOCK FROM APRIL TO SEPTEMBER.

	Parts.
Weatings	4
Bran	3
Maize meal	2
White fish meal	½

Where grass is not available, or when the birds are kept in enclosed runs, it is well to include from ½ to 1 part of alfalfa meal. Meat meal can also be used in place of fish meal.

Many farm poultry-keepers like to use home-grown foods, especially if they are able to grind them on the farm. The following mash is recommended to them. It is suitable for laying stock, whether confined or not.

	Parts.
Weatings	2
Wheat meal	2
Bran	3
Barley meal	1
Ground oats	1
White fish meal	1

MASH FOR HENS KEPT IN AN INTENSIVE HOUSE OR IN A BATTERY.

	Parts.
Weatings	3
Bran	1
Maize meal	3
Alfalfa meal	1
White fish meal	1
Sussex ground oats	1

Add 1 pound of common salt and 1 pint of cod-liver oil per 100 pounds of mash. The oil is mixed with a little bran, which is then worked into the bulk of the food.

MASH FOR BREEDING STOCK.

	Parts.
Weatings	4
Bran	2
Maize meal	1
Sussex ground oats	1
Alfalfa meal	1
White fish meal	1

Add 1 pint of cod-liver oil per 100 pounds of mash.

GRAIN RATIONS FOR ALL STOCK RECEIVING GRAIN AND MASH.

Winter Mixture.

	Parts.
Wheat	1
Cracked maize	1
Plump white oats	1

Summer Mixture.

	Parts.
Wheat	2
Cracked maize	1
Oats	1

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Some poultry-keepers feel that a mash is incomplete without minerals additional to those found in the meals and grains used. Excessive quantities are likely to do harm, and in rations for both adults and chicks not more than 2 per cent. by weight of any mixture should be used. Ordinary common salt has been found suitable, and 1 pound mixed with every 100 pounds of mash will suffice.

In the event of there being a shortage of lime in the foods, ground limestone can be added at the rate of 2 pounds per 100 pounds of mash.

If vegetable proteins are preferred to either fish meal or meat meal, extracted soya bean meal can be used. In such cases it is advisable to add an extra 3 per cent. of soya meal in order to bring the protein content to the level of the animal food.

Systems of Feeding.—Having decided on the rations to be fed, the next point to consider is the system of feeding. During the past few years several methods have been tried, but I am of the opinion that results should be the deciding factor as to the suitability of any particular method.

Grain and Dry Mash.—This is probably the most popular system. All have their advan-

tages and disadvantages, and in this case there are possibilities of waste and the risk of disease spreading through contamination of the mash by infected birds. Another disadvantage is that one is prevented from using ingredients of a fibrous character, such as flaked maize and large-grade biscuit meal. It involves the feeding of a percentage of grain once or twice a day plus dry mash *ad lib*.

Grain and Wet Mash.—This is one of the oldest systems, and is still favoured by large numbers of poultry-keepers. Generally speaking, half the day's ration is given in the form of grain and the rest in mash. The system provides an opportunity to use coarser mashes, and those who believe in cooked vegetables can make the fullest use of them in a wet mash.

Combined Wet and Dry Mash with Grain.—This method has been tried by large numbers of commercial poultry-keepers with great success. It is specially suitable for winter, in that the wet mash provides an extra amount of food at a time when it is difficult for the birds to secure enough through dry-mash feeding alone. The short hours of daylight during the winter months restrict the feeding activities of the birds unless artificial light is allowed, but this method provides opportunities for them to

obtain the right amount of food in daylight. The idea is to allow a quantity of grain plus dry mash *ad lib.*, and about 1 ounce of wet mash per bird. In all cases the same mash mixture can be used for wet and dry feeding, but some poultrymen prefer to give a different wet mash.

Pellet Feeding.—Poultry-keepers who use hen batteries feed either pellets or dry mash. Pellets form an attractive class of food and are easily handled, while there is less waste than with dry mash. The difficulty with pellets lies in the inability of the poultry-keeper to alter the ingredients in cases where it is thought advisable to vary the diet.

With reference to the actual quantities of food needed, this will depend to some extent on the breed, system of farming and season of the year. Approximately 4 ounces of food are needed daily for adult stock, 2 ounces of grain and 2 ounces of mash per bird, but in certain cases more or less may be allowed. Practical experience in the art of feeding is necessary before one can gauge the requirements of the flock. During the moulting period less food is needed, because egg production has ceased temporarily and there is not the same demand for it.

All wet mash should be fed in troughs. It is advisable to provide ample space so that every bird secures its quantity of food. A V-shaped trough, 6 feet long, about 6 inches deep, with the same distance across the top, will be large enough for twenty adult birds to feed comfortably. The same considerations of space apply in the case of dry-mash hoppers. A mash hopper, 6 feet long, on legs, arranged so that the birds can feed from both sides, will be sufficient for thirty birds. Grain can be broadcast in the litter, but as there is a risk of the latter becoming foul it is better to use troughs. Dry mash should be given daily in sufficient quantities to last the day; it is much better to add small amounts than to fill the hopper to its fullest capacity. Stale mash is not relished by the birds, and its continuous use will result in low consumption and decreased egg yield.

Wet mash can be improved in winter by using warm water or boiled vegetable matter. The mash should be mixed into a moist crumbly state, so that it will bind when pressed and break up into small particles when placed in troughs.

Importance of Water, Grit, Shell and Green Food.—A liberal allowance of clean water is essential

for health and egg production. The analyses of the new-laid egg and the fowl's body show a high percentage of water, and this should act as a warning not to restrict the quantity.

Grit and shell should always be available, but they should not be mixed with the food.

Green food should be given to birds which are prevented from coming in contact with grass, especially stock kept intensively. Marrow stem and thousand-headed kale, and cattle cabbage, are all useful substitutes, but the quantity allowed should not exceed 5 pounds per 100 birds daily.

Size and Care of Runs.—The size of any run is governed by the number of birds forming the unit. On free range it is customary to allow an acre for flocks of one hundred and fifty birds. For small runs of the semi-intensive type, such as are used for breeding stock, 20 square yards per bird is the minimum. Grass runs pay for good treatment, and one important consideration is that of keeping the growth short. In a wet period this cannot be accomplished by the birds themselves, and the help of sheep or geese is essential. As an alternative the grass can be cut with a scythe or mower periodically. There is usually no

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difficulty with free-range grass when cattle or sheep are allowed to graze with the fowls.

At least once a year all runs should receive a dressing of finely slaked lime at the rate of from 1 to 2 tons per acre. If it can be managed it is a good plan to chain-harrow and roll the sward periodically, in order to remove the rough herbage and make the soil firm. No opportunity should be lost of securing fresh land for runs, and, if this is impossible, then the existing runs should be given the greatest care.

CARE OF APPLIANCES.—The life of any appliance depends on the treatment it receives. Many small appliances, such as food-troughs, water-fountains, small rearing-houses and the like, are used only during the rearing season, and their life can be doubled if they are cleaned and stored, while wooden materials should be creosoted. Iron appliances should not be stored until they have been thoroughly dried, otherwise they will rust and quickly become useless.

On large poultry plants it may not be possible to creosote all the houses every year, but they should receive a coating once every three years. This can best be done by treating one-third of the houses each year.

CHAPTER 5

INCUBATION—ARTIFICIAL AND NATURAL

Management of Incubators—Selection of Eggs—Turning and Cooling—Testing—Moisture—Natural Methods—Care of Broodies

THE incubating season is one of the most exacting in the poultry-keeper's programme, and in some cases it extends from November to April. Good hatching makes the work a pleasant undertaking, but poor results will considerably affect the programme and prolong the season.

On large plants it is advisable to arrange the hatching plans well in advance in order to make certain of securing the necessary eggs. In commercial circles it is customary to allow four eggs for every pullet required; this means that in order to produce a thousand pullets some four thousand eggs must be set. The incubation of such a large number necessitates the arranging of dates carefully so as to avoid overcrowding the brooder space.

The first thing to do is to provide accommodation for the necessary number of incubators.

Sometimes an outbuilding can be converted into a serviceable room; in other cases it may be advisable to provide a special building. Small poultry-keepers often find space for working odd machines in a spare room in the house. The building should be large enough to provide sufficient room for the attendant to work without fear of accidents. There should be plenty of floor space, good ventilation that can be controlled, a moderate amount of light and a room temperature of 65° to 70° F. Ventilation should be below the machines, the inlets being about 1 foot from floor-level, and the outlets fairly near the roof. The floor may be of earth, cement or wood; but cement is best, as it is easy to clean. An even room temperature is not easily secured, but much can be done by selecting a shady site and having the room specially lined with non-conducting material.

PREPARING THE MACHINES.—Novices are advised to study the instructions sent with the machines before attempting to use them. Those with more experience will probably have found that each make of machine requires a different method of management, and it is only by practice that the art of correct manipulation can be mastered. The instruction books give information with regard to the

actual fixing of the various parts, some of which are extremely sensitive. After the machines have been carefully assembled, they should be properly regulated before eggs are put in, otherwise there is a possibility of the whole batch being spoilt. All capsules and thermometers should be tested at the beginning of each season, as they form the most vital parts of the machine. Thermometers are best tested by the local chemist, but capsules should be held in water heated to a temperature of 80° F. until they expand. It is dangerous to use a weak capsule or a faulty thermometer. The machines must be clean, and it is advisable to replenish any doubtful parts, such as felts or canvas. They should stand level and be arranged so that a good circulation of air is assured around them. With regard to capacity, I have found the 150-egg size is the best for commercial purposes and the most economical to use.

The correct working temperature of the ordinary type of incubator is 103° F. If the machines are properly regulated before eggs are placed in them, there should be no difficulty in securing an even temperature throughout the period. It is a good plan to regulate the machine so that the damper rises at a

temperature of about 102° F. This will prevent the eggs from getting overheated when the embryos begin to develop and generate heat. The regulating devices must not be altered after the eggs have started to incubate, as any adjustment at this stage may upset the general working arrangements. Machines can be heated with oil, gas or electricity, but oil heating is the most common method.

When an oil-heated incubator is being started, a moderate flame should be provided at first and gradually increased until the desired temperature has been reached. There is always a tendency for the flame to increase, and many fires have occurred through overheating during the regulating period. Best-quality oil should be used, the lamps kept clean, trimmed daily and not overfilled. The foregoing remarks are applicable to both hot-air and hot-water types in so far as their working is concerned. Tank machines should be filled with water heated to 120° F., but if it is desired to gain a little more experience in their regulation cold water may be added.

Cabinet machines should be kept in a separate room apart from the smaller models, and ample space should be provided in order to ensure a satisfactory flow of fresh air.

SELECTION OF EGGS.—Eggs intended for incubation should be not more than a week old. The best results are secured from absolutely fresh eggs, for as the egg ages the vitality of the germ deteriorates. In addition to freshness it is important to have good size, shape, colour and shell texture. The quality of the chick is governed by the class of bird producing the eggs, and in all cases these should be from blood-tested stock. When the eggs are placed in the various machines, the trays must not be overcrowded. The incubator door is usually left open for an hour or two after filling, in order to prevent too rapid heating of eggs.

TURNING AND COOLING.—Eggs should be partly turned over three times daily from the second to the eighteenth day. The advisability of cooling at any stage of incubation is a debatable point; some poultry-keepers cool for short periods, others not at all. I do not advocate cooling beyond the time taken with the turning, but everyone should follow the method they find best. Strong, healthy chicks can be produced from eggs which have not been cooled, and there is no doubt that many are spoilt in the winter period through overcooling.

TESTING.—It is advisable to test the eggs

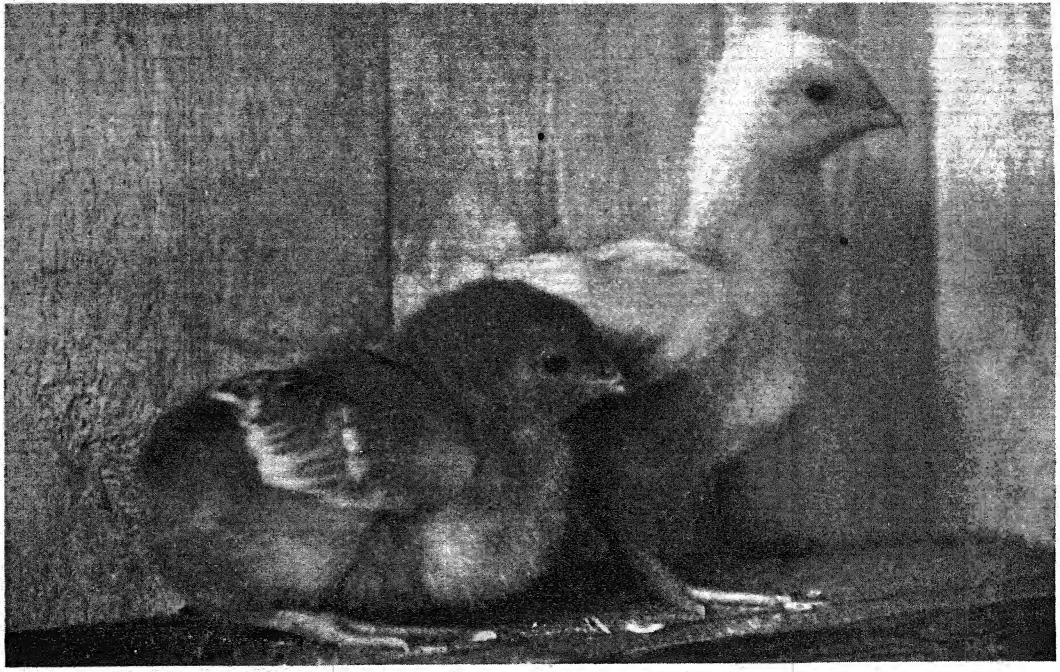
once or twice during the incubation period in order to find out whether the fertility is satisfactory. This also enables the unsatisfactory male and female breeding birds to be traced. Testing can be done at any hour of the day if the room is darkened, and I suggest the tenth day for this purpose. The method is to hold the eggs before a strong shaded light or, in cases where trays are used, a strong hand torch can be placed under the tray and the infertile eggs removed. Infertile eggs are easily distinguished; they resemble a fresh egg, and are quite good for culinary purposes. Weak germs are the result of poor fertilisation, and in cases where there is a high percentage it is best to use another male. Addled eggs are easily detected; they contain dead germs which have died at various stages of incubation, and when held up to the light a floating mass of dark liquid is seen. Stuck germs are the result of failing to turn the eggs some time during the first week of incubation. The advisability of testing a second time depends on the results of the first test. If a large percentage of bad eggs has been removed, then it is best to test again on the sixteenth day. The eggs removed should only be replaced by eggs from incubators set at the same time.

MOISTURE.—A moist atmosphere is conducive to good results, and from the early stages of incubation it is advisable to provide ample moisture. All moisture trays should be kept full during the incubation period, and as an extra precaution one should sprinkle the eggs with warm water once daily during the last week. The condition of the air space at the large end of the egg provides the information in connection with this problem. Under normal conditions the space should be equal to about one-fifth of the size of the whole egg on the sixteenth day. If it is larger than this it proves that the atmosphere is too dry, and if smaller it denotes excessive moisture. The old-fashioned method of soaking a piece of flannel and laying it over the eggs for ten minutes is very effective. The eggs must not be disturbed when they begin to hatch. It is a good plan to have a felt over the glass front of the machine in order to avoid crowding. The chicks always try to come to the light as soon as they have dried off, but the darkened condition of the interior provided by the felt prevents this. During the winter and early spring it is not advisable to allow the chicks to drop from the egg tray to the nursery drawers, because the temperature of the latter is much

lower than that of the egg tray, and this sudden change will result in the chilling of the chicks. They should remain in the hatching tray until ready to remove to the brooders, usually within twenty-four hours from the appearance of the first chick. Following the completion of the hatch, all interior parts of the incubator should be disinfected.

NATURAL METHODS.—Natural methods of incubation do not appeal to commercial poultry-keepers, and it is usually impossible to secure sufficient broodies during the hatching season. There is also a great deal of extra labour involved, and the actual cost of producing the chicks is higher than when artificial methods are employed. If the sitting period is reckoned, together with a further eight weeks for brooding the chicks, nearly one-quarter of the hen's laying year is accounted for. Taking into account the loss of eggs in this period, the amount of attention required and other incidentals, it will be seen that the method is expensive.

In the event of broody hens being used for hatching, it is essential to procure the right type, and they must be really broody before they are given valuable eggs. Most of the dual-purpose fowls sit well, and so do cross-



Farmer and Stockbreeder.]

SEX-LINKED DAY-OLD CHICKS, RHODE ISLAND RED × LIGHT SUSSEX.

bred stock from heavy breeds. Light breeds and crosses with non-sitting blood in them are very unreliable.

Sitting-boxes containing half a dozen nests, each not less than 14 inches square, are a handy size and provide enough space for general use. Nest-boxes should have wire floors and movable fronts, so that they can be easily cleaned. Some poultry-keepers object to using pullets for sitting, but if quiet, good-conditioned birds are selected there is no great difficulty in securing satisfactory results.

The best place for the sitting-boxes is in a shed right away from other birds. This should be well ventilated, rather dark, and free from rats. The nests should be well made, first using a layer of straw well broken up and then a thin covering of meadow hay, arranging the material so that the centre of the nest is slightly lower than the outside.

The birds must be free from scaly leg mite and lice. When they are ready for sitting, it is a good plan to put a china egg in each nest and to place the birds on the nests at dusk, allowing them a day to get accustomed to their new surroundings. Covering the nest-boxes with sacks helps to avoid disturbing the hens any

more than is actually necessary during the sitting period.

CARE OF BROODIES.—When the hens have settled down, a dozen to fifteen fresh, sound eggs can be set under each bird, preferably at dusk; this can be done without lifting them off the nests. A chart showing the date set, date due, number of eggs, variety, number fertile and number of chicks hatched provides a useful record. The hens should be removed from their nests once a day throughout the sitting period and given maize, water and grit *ad lib.* Whilst the hens are feeding attention can be given to the nests and eggs. In the event of any eggs being smashed in the nests, the remainder should be washed with warm water and the nesting material replenished. It is usual to allow the hens to remain off their nests for about ten minutes the first ten days, and fifteen minutes the rest of the period. If fertility is found to be poor when the eggs are tested on the tenth evening, the fertile eggs from two or three nests can be put together and some of the hens given fresh sittings. Two days before eggs are due to hatch the hens should be dusted with a good insecticide.

The eggs generally begin to hatch on the eve of the twentieth day, and at this stage the hens

should not be disturbed until they have finished hatching. Some birds attempt to destroy the chicks as soon as the eggs begin to chip, and in such cases it is best to remove the chicks from the nest and put them in a warm place until the hatch is completed. Otherwise the chicks should not be moved from the hens until they are ready to go into the coops.

CHAPTER 6

REARING THE CHICKS—ARTIFICIAL AND NATURAL METHODS

Systems of Artificial Brooding—Natural Methods—Toe-Punching—Sexing

THE rearing of the necessary number of chickens for any large poultry farm necessitates the use of artificial appliances, and it is doubtful whether the natural method could be used as the sole means of rearing with any degree of success in such cases. If artificial methods of incubation have been used, they must be followed by artificial methods of rearing.

The chief point at issue is the system of brooding to be adopted, and as there are about half a dozen different methods from which to choose it is advisable to consider them before making a decision. It is most important to have ample brooder accommodation and equipment for the whole of the chicks all through the season, and to have it available on the proper dates. The first eight weeks is a very important period in the growth and

general development of the chicken. Many thousands of chicks are spoilt during rearing, either through faulty brooding arrangements or wrong methods of feeding.

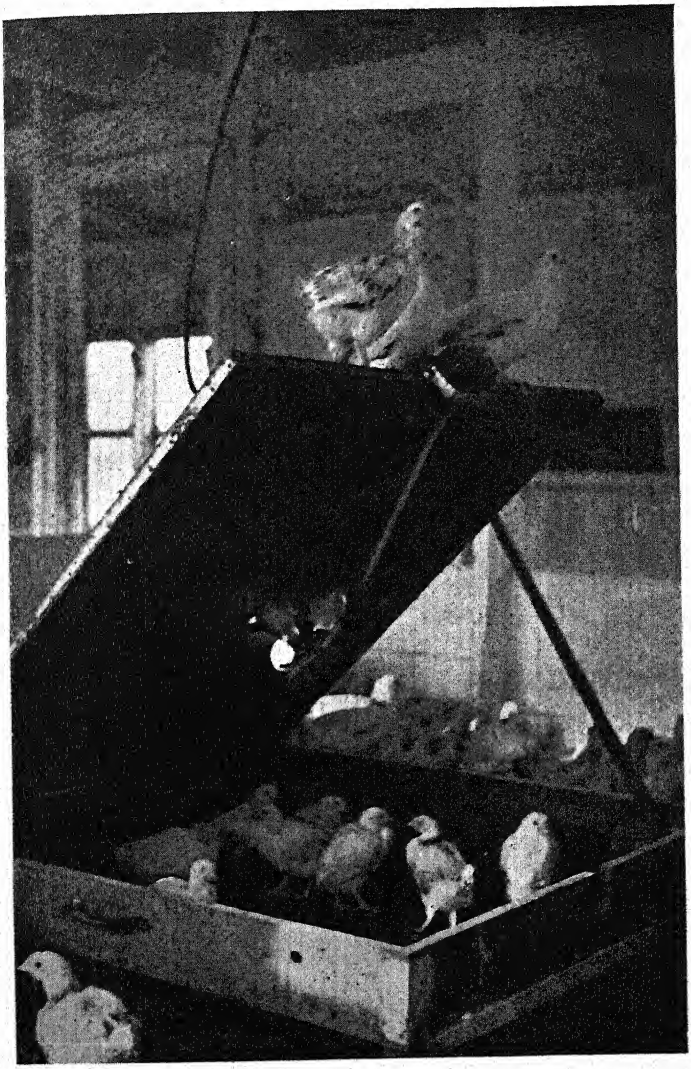
SYSTEMS OF BROODING. — The system of brooding to be followed depends on the general requirements of the poultry-keeper. The rearing of a few hundred chickens presents no great difficulty, but when there are several thousand more care is needed in planning ahead and securing adequate accommodation.

Adaptable Hover.—The safest method in my opinion is the small-unit adaptable hover system, which is satisfactory for small or moderately large groups, and makes it possible to control disease to a great extent. With adaptable hovers the unit generally varies from fifty to one hundred and fifty chicks. Small portable houses and runs can be used, and this is a special advantage when it is desired to provide clean land. With reference to the type of house necessary for housing the brooders, there are a number of good models from which to select. A house measuring 8 feet square provides 64 square feet of floor space, sufficient for one hundred and twenty to one hundred and fifty chicks. There should be ample light and ventilation, two important

factors in successful chick-rearing. Adaptable hovers can also be used successfully in spare buildings, and on some farms it may be possible to convert a disused shed into a serviceable brooder house. If preferred, fixed houses can be used, but they call for the allocation of sufficient land to each house for the season's rearing. It is unwise to attempt to rear chicks on stale ground, because of the risks of diseases such as coccidiosis and worm infestation.

Electric Brooders.—In some districts it is possible to make the fullest use of electric power, bringing into action electrically heated brooders, which can be purchased at reasonable prices. There may be some difficulty in arranging for a steady supply of current, and the charges may be too high in some districts to make its use worth while. It takes one unit per chick for an eight-weeks period of brooding, and the charge varies from one halfpenny to threepence per unit, compared with one penny per chick for oil lamps. It has been said that there is a difference in the general development of electrically brooded chicks as compared with those reared under hovers heated by oil, but no confirmation of this statement has come to my notice.

Anthracite Stoves.—This system of brooding



Farmer and Stockbreeder.]

ELECTRICALLY HEATED HOVER.

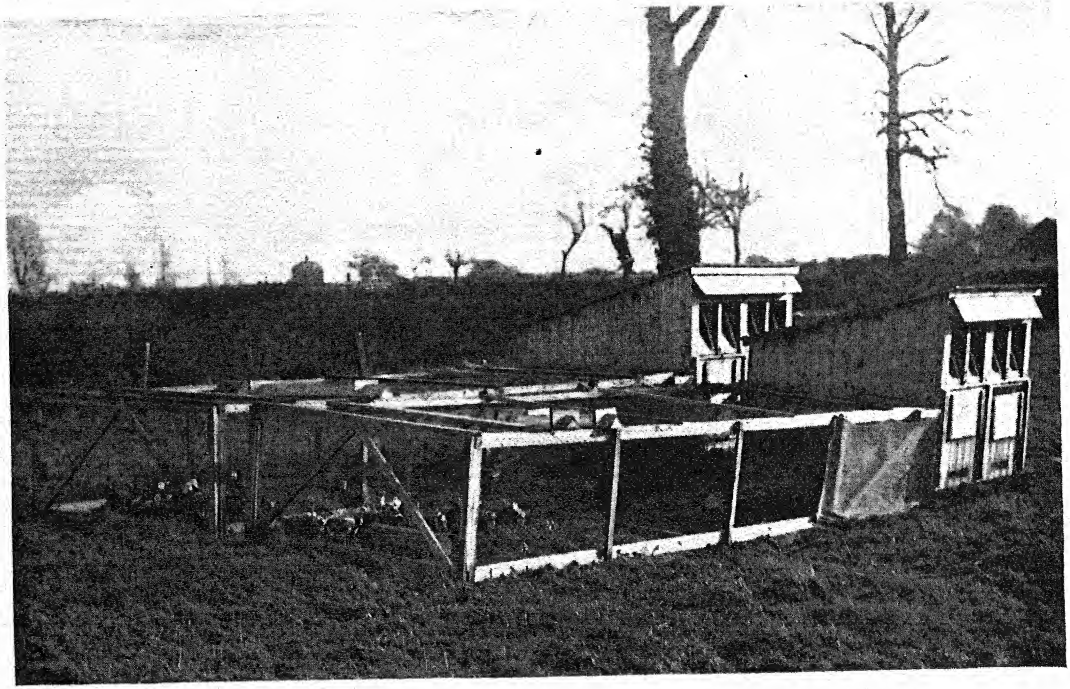
was very popular at one time, particularly in the days when large units were favoured. Groups of five hundred chicks were quite common, but more recently this number has been reduced by half, owing to the difficulties of controlling large groups. The system prevents the use of the portable type of house already recommended, and there are difficulties in regard to the provision of stoves suitable for brooding small groups. In these stoves only the best quality anthracite cobble coal should be used; other fuels prove most unsatisfactory. The cost of rearing chicks for eight weeks is approximately twopence per chick by this method. For reliability these stoves are hard to surpass, and in winter they maintain a very steady temperature.

Radiator System.—The radiator system of brooding has not developed to any great extent during the past few years, although it is very good and is particularly suitable for intensive rearing. It is a little unfortunate that the method necessitates a fixed type of brooder house, but it is impossible to arrange otherwise. Poultry-keepers are not engineers, and even if they had leanings in this direction they would not like to be involved in the frequent erection of pipes and stoves. If this system is

adopted, it is wise to provide double grass runs, so as to avoid the risk of using foul land. It is one of the cheapest methods, because one stove heats a large number of radiators and fuel costs are very low.

Outdoor Brooders.—For those who require small numbers of chicks, the majority of which are hatched in spring, the old-fashioned outdoor brooder cannot be surpassed. Up to a few years ago it was the chief method practised, and results were generally satisfactory. There are plenty of good types on the market and prices are reasonable, but the actual cost per chick is higher than with some of the other methods, because it is important to avoid placing too many chickens in them. As a rule the number recommended is too great for the size of the brooder after the first two weeks by approximately 50 per cent.

Outdoor brooders provide ample opportunities for the use of clean land, and as many of the types are easily moved it is advisable to make the fullest use of this advantage. The ground should be level, dry and well sheltered, so that the attendant is not unduly handicapped in the work of cleaning and trimming the lamps, which is not a pleasant job in bad weather.



Farmer and Stockbreeder.]

PORTABLE COLONY BROODING HOUSE WITH RUN.

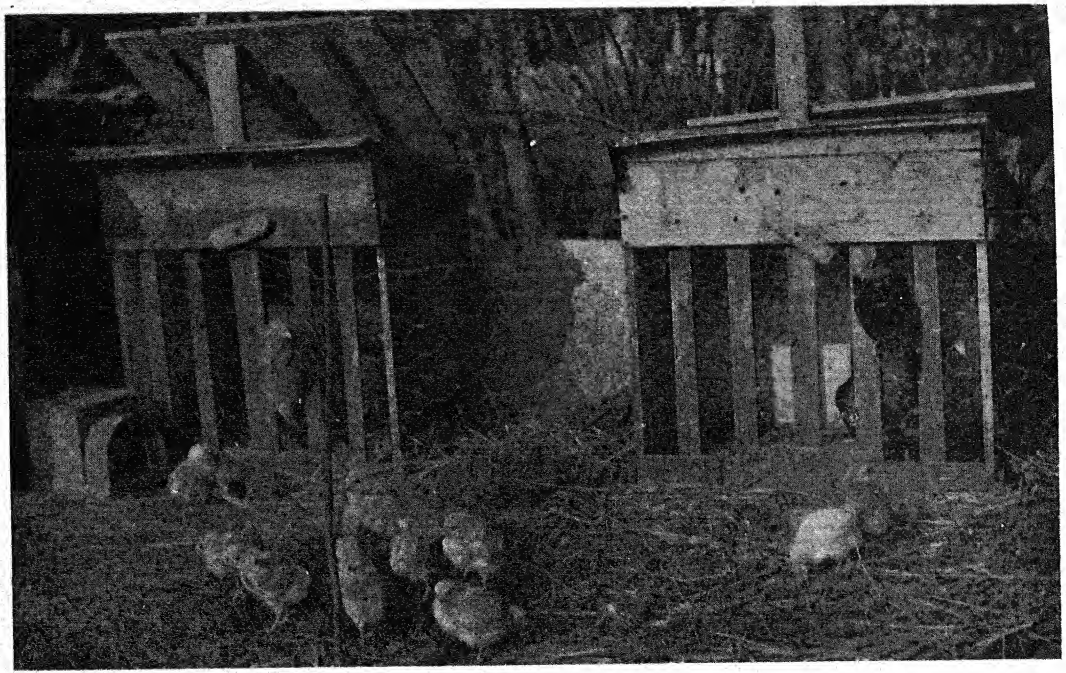
Battery System.—A few years ago the battery system of brooding was introduced. Opinions vary regarding its good and bad points, but most users are agreed that it is a method more suited to the rearing of table chickens than for birds needed for laying, and I share these views. It cannot be described as a natural system; as a matter of fact, it is the most unnatural of all methods, but this should not necessarily condemn it. Whatever the after-effects of rearing in batteries, they do not become noticeable in table birds, whose life is about sixteen weeks. The system encourages mass production, and seems to meet with the approval of the majority of those engaged in this line of work.

NATURAL METHODS.—Backyard poultry-keepers will not go far wrong in attempting to rear their chickens by the natural method, the broody hen. It would be impossible for a large-scale poultry-keeper to adopt it, because of the shortage of broodies at a period when most needed. Imagine the poultry-keeper with twenty thousand head trying to hatch and rear all his replacements with broody hens! Natural methods make it possible to rear strong, healthy stock without the use of Nature's substitutes, such as cod-liver oil and other ingredients.

In order to secure the best results, proper coops should be provided. It is a good plan to use a standard type of coop. The commonest pattern is the lean-to, the average size being 2 feet square (floor measurement), 2 feet high in front and 18 inches at back, with laths in the front, the centre one being movable so that the attendant can get to the hen. Floors are advisable at all periods of the year as a protection against vermin and dampness, and as a means of keeping the land clean.

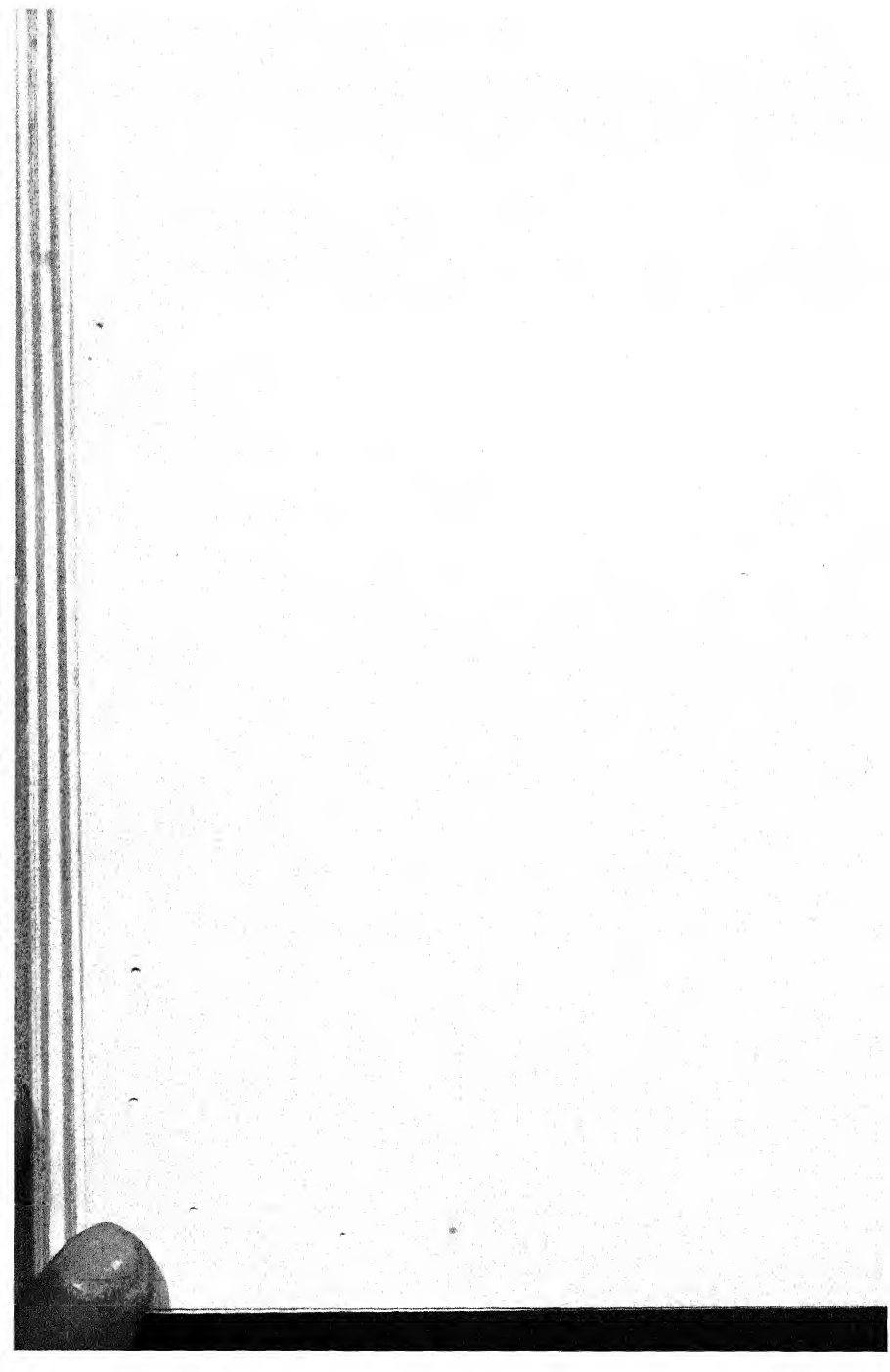
Chicks reared naturally should be kept apart from others, and a separate section of the rearing field should be wired off for them. Broody hens should be confined to their coops all through the rearing period, the coops being moved daily on to fresh ground. The grass must be kept short all through the early stages of brooding, and this is where the old-fashioned scythe plays a useful part. Long grass will prove harmful to the chicks during a wet period, resulting in chills and heavy losses. Free-range rearing is not often practised, but there is no objection to the method. As a rule, the chicks are kept under somewhat restricted conditions for the first four weeks, and then allowed free range.

TOE-PUNCHING.—It is a very good plan to



Farmer and Stockbreeder.]

NATURAL BROODING.



adopt a system of marking the chicks so that the different ages and strains can be recognised at any period of growth. This is very necessary when chicks are hatched from a variety of matings, or when eggs or chicks are purchased from other breeders. Chicks should be marked when they are taken from the incubators or hens. There are sixteen different combinations of marks, making it possible to identify a similar number of matings. Some prefer to make a slit in the webbing, others like to use a toe-punch. If slitting is practised, the foot should be placed firmly on a board and cut with a small sharp knife, care being taken not to make the incision too large. A chart showing the different markings should be prepared and kept in a convenient place, so that information can be obtained on any of the matings as and when needed.

SEXING.—During recent years the sexing of day-old chicks has been widely practised with satisfactory results, and purchasers can now secure day-old pullet chicks of any breed. The method calls for special training in the art of distinguishing the anatomical difference between males and females. Most hatcheries employ experts, and their services are also available to ordinary poultry-keepers at agreed charges.

The ordinary method of sexing at later stages of development, usually from about eight to ten weeks, can be undertaken by any poultry-keeper. Heavy breeds are more difficult to cope with than light breeds, but a little practice soon enables one to deal effectively with any breed. The sex is determined by certain characteristics, the head playing an important part. All males develop faster than females, and at the age of ten weeks the combs of the heavy breeds are quite conspicuous, the pullets' combs being much smaller and lighter in colour. In the case of light breeds the same conditions are met with a month earlier. Body size is much more pronounced in the males than in the females, and there is also a remarkable difference in the growth of feather, especially amongst the heavy breeds. At the age of ten weeks most of the pullets are fully feathered, whilst the males are sparsely feathered on the shoulders, back and tail. Separating the sexes enables the poultry-keeper to get rid of the surplus cockerels at an early age, or, if he prefers, to grow them on by themselves as table birds. The pullets develop much better when separated from the males, and they are less likely to lay prematurely. Cockerels intended for future

breeding purposes should be kept apart from those which are destined for the table. Sometimes it is impossible to make the selection at the time of sexing, but a number of promising birds can usually be picked out, and stock birds may be selected from them at a later stage.

CHAPTER 7

FEEDING AND GENERAL MANAGEMENT OF CHICKS FROM SHELL TO MATURITY

Systems of Feeding—Quantities—Rations—After-Care—Fattening Surplus Birds—Coop Fattening—Stock Cockerels—Hen-Reared Chicks

UP to the present I have stressed the importance of doing everything well, inferring that results will depend on the ability to practise efficiency. The same diligence is needed in regard to the feeding and general management of the chickens from shell to maturity. We have to remember that correct feeding from start to finish is essential in order that the birds may develop on the right lines. An adequate supply of good food should be the aim, and those who are not prepared to follow this advice are likely to be disappointed.

Food is essential for growth, bone development and feather formation, and this means that certain properties must be embodied in the ration. These are very similar in character to those used in adult stock rations; in fact, they are so much alike that it is feasible to

use the same for chickens and older stock. This is not often practised, however, because the mash mixtures used for adults are usually too fibrous for young chicks, and likely to prove detrimental to their digestive organs.

SYSTEMS OF FEEDING.—There are, of course, several systems of feeding, and every poultry-keeper must be guided by experience and the circumstances in deciding on the one to adopt. It must be admitted that the personal element counts for much; hence the advisability of the poultry-keeper maintaining close contact with the work. The best food in the world will not produce the right class of stock unless it is properly fed. There is no best system; excellent results have been secured from all. Some have found that they secure better growth during the early weeks of rearing by feeding wet mash in addition to grain and dry mash. Others claim that wet mash makes no difference at all.

It is very desirable to educate the chickens in regard to feeding methods, so that when they arrive at maturity, adult systems can be introduced without causing a setback. Assuming that a commercial egg producer favours the combined system of dry and wet mash with grain for adults, it will be wise to feed the

growing pullets on similar lines. Very often a change in the system of feeding at the matured stage will cause a large number of the birds to moult. I have seen excellent pullets on the point of laying refuse dry mash because they have never had the opportunity of getting accustomed to it beforehand. It is not often that birds will reject wet mash, but they will hesitate over dry mash for some time if they are unaccustomed to it, and during that period they are losing condition through lack of food.

Although a large percentage of poultry-keepers favour dry mash and grain feeding, many of them introduce some wet mash into the daily ration, and I feel sure that this is a further step towards securing stamina in the stock. Such a method links up with the similar adult system. I should also like to see more grain fed throughout the early period, so that the gizzard may perform the job nature intended it to do. For several years it has been the practice to supply half of the daily food in the form of mash, but I am certain that a little less mash and more grain would produce just as good birds.

One of the drawbacks of the dry-mash system is the tendency for the chicks to waste a certain amount of food. If this could be

prevented there would be less risk of disease amongst the flocks.

Pellet feeding is also gaining favour amongst certain poultry-keepers, and in course of time it will probably increase in popularity. It is labour-saving and less wasteful than dry mash, but the user has no opportunity of introducing "home recipes".

Before the rearing season commences it is advisable to consider the whole question of feeding, so that a decision can be arrived at regarding the actual mixtures to be used. Having decided on this point, one should be prepared to use the rations all through, unless there is a definite reason for changing. It is not in the interests of the chickens to make any drastic alterations in their diet, but shortage of certain materials, or economic conditions, might make it necessary to re-adjust the ration.

QUANTITIES.—During the early period of rearing it is not easy to gauge the exact quantity of food a group of chickens will consume. Novices are more likely to overfeed then underfeed, and I realise the difficulties, especially when grain is fed. There is also a tendency to allow too much dry and wet mash, with the result that the wastage is considerable

when spread over the whole rearing season. During the first few days chickens consume very little food, and not a large quantity during the first three months, as the following figures show. In the first week the total mash and grain consumption per chick is not likely to exceed 2 ounces; in the second week, 4; in the third, 4½; in the fourth, 5; in the sixth week, 10 ounces; and in the twelfth, 1¼ pounds. After this period there is less difficulty in judging the quantity required. Taking into consideration the total amount fed and the surplus left over, it will be possible to calculate the approximate amounts needed. Surplus food left about encourages rats and wild birds, which are carriers of disease. Food must be fresh when fed, as stale food causes digestive troubles which may lead to increased mortality.

RATIONS.—Many poultry-keepers favour their own particular mixtures; consequently the rations given here may not appeal to them, but they will serve as a useful guide to those who desire to feed their stock correctly.

GRAIN RATIONS FOR CHICKS.

First month :

Equal weights of cracked wheat, finely cracked maize and pinhead oatmeal.

Second month :

Equal weights of whole wheat, cracked maize and groats.

Rest of rearing period :

Equal weights of whole wheat and cracked maize.

MASH MIXTURES. (PARTS BY WEIGHT.)

(Suitable for dry and wet mash feeding.)

First ten weeks :

Weatings	6
Bran	6
Yellow maize meal	4
Sussex ground oats	2
White fish meal	1
Alfalfa meal	1

and

1 pound common salt } per 100 pounds of
1 pint cod-liver oil } mash.

Mix the oil with a little bran and remix with rest of mash.

Ten weeks to maturity :

Weatings	4
Bran	3
Maize meal	2
Sussex ground oats	1
Fish meal	1

and

1 pound common salt per 100 pounds of mash.

If chicks are kept intensively, 1 part of alfalfa meal must be included, together with 1 pint of cod-liver oil per 100 pounds of mash.

Fattening rations for table chickens on range or in confined runs :

Equal weights of
Weatings
Maize meal
and Sussex ground oats
with 5 pounds dried skim milk per 100 pounds of mash, unless separated milk is available.

Fattening rations for chicks confined in fattening coops :

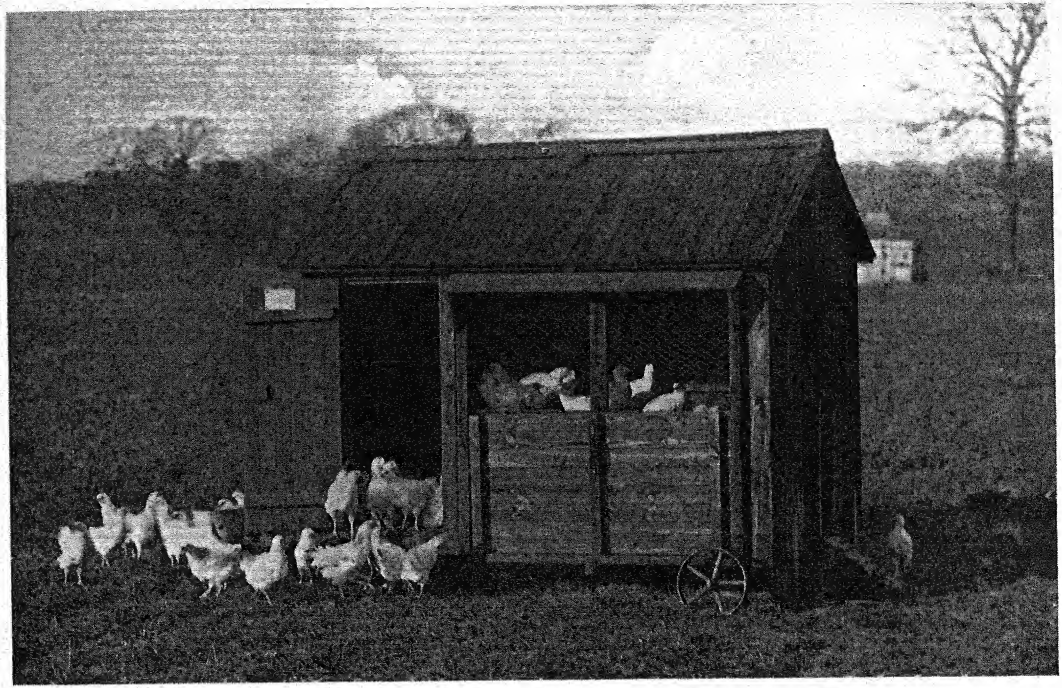
Sussex ground oats	3
Weatings	1

If available use separated milk; otherwise add 5 pounds of dried skim milk per 100 pounds of this mixture.

AFTER-CARE OF CHICKS.—As the chicks develop one is concerned with their future welfare, and after the weaning stage the pullets should be drafted to the ranges and kept apart from the cockerels. Arks or slatted-floor houses will answer the purpose well, and so long as there is no overcrowding results should be satisfactory.

Periodical culling is advisable in order to remove any birds failing to develop satisfactorily. There are always a few poor doers, and the sooner these are marketed the better.

When the pullets reach the laying stage, preparations should be made for moving them into their permanent quarters. Early-hatched



Farmer and Stockbreeder.]

PORTABLE COLONY HOUSE FOR GROWING STOCK.

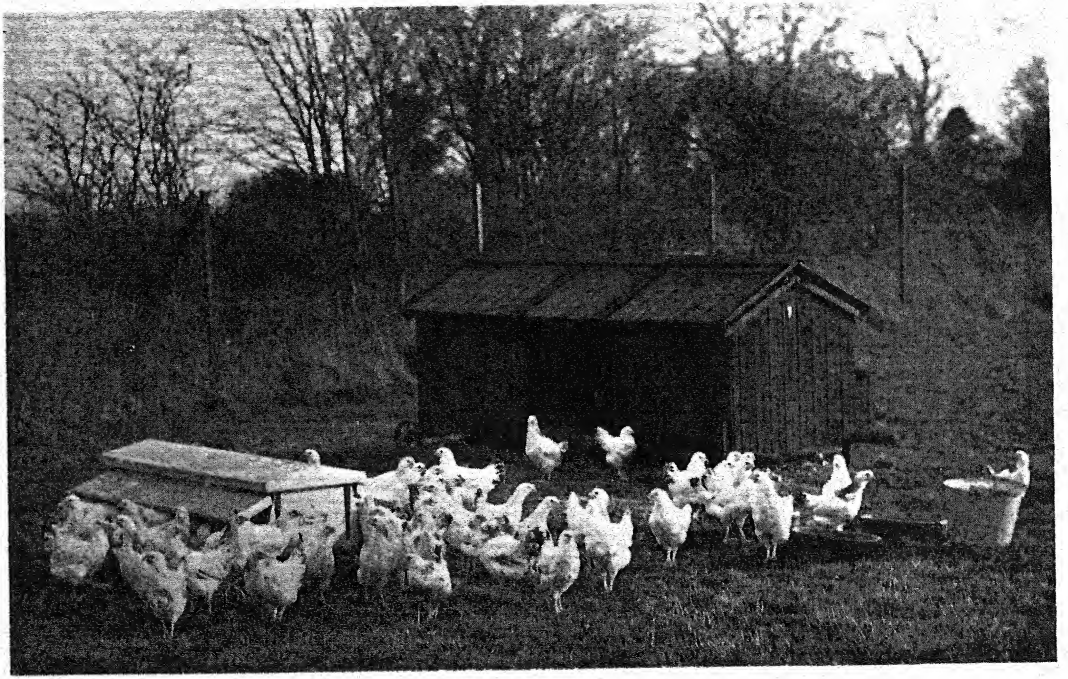
birds may show signs of laying before the houses are available for them, in which case temporary nests must be provided until they can be accommodated. It is essential to cull and sell the yearling hens in order to make room for the pullets, and all this work should be carefully planned so that adequate space may be secured. It is better to move pullets before laying commences, otherwise the change may cause a moult, with a postponement of egg laying. The adult ration should be introduced gradually, so that by the time they are in full lay the birds have dispensed with the rearing ration.

When sorting out pullets for the various laying units, groups of the same age, size and condition should be selected as far as possible. Mixed flocks are much more difficult to manage, and good production cannot be expected from them. Special attention should be paid to general health, and inferior specimens should be fattened for table use. In the event of any of the pullets showing a tendency to "break bounds", this can be stopped by cutting the flight feathers of one wing.

FATTENING SURPLUS BIRDS.—If it is intended to get rid of all surplus stock irrespective of sex, they should be fattened, and sold as early

as possible after reaching the marketing stage. It must not be expected that every bird will make a first-class chicken; some will not respond to any method of fattening. It is best to avoid any which are obviously too thin or showing signs of disease. As chickens will not fatten if overrun with lice, it is a good plan to examine them and, when necessary, to apply a spot of nicotine sulphate to the feathers under the breast when placing them in the coops or in the runs. Small groups of about twenty birds do best, and they can be accommodated in any ordinary house with a small grass run. When they are first brought in from range it is usual to starve them for a few hours and then feed sparingly for a couple of days, gradually getting them on to full rations. Each day they should have three meals of the fattening mixture, fed in a moist, crumbly state. As much food as they will eat should be provided at each meal, allowing half an hour before removing any surplus, and they should have water or milk to drink. Saleable chickens should be produced in a month, but if necessary the treatment can be continued for a longer period.

COOP FATTENING.—Birds which are fattened in coops must not be confined for more than three weeks, as there is a tendency for them



Farmer and Stockbreeder.]

SUSSEX ARK FOR GROWING STOCK.

to lose flesh after this stage. Greater care is advised in the selection of the birds, especially as regards body condition. If the coops are covered with sacks between meal-times, it encourages the birds to rest. Sometimes it is possible to place the coops in a dark outbuilding; dark surroundings help to reduce the risks of feather-eating and cannibalism, two of the greatest troubles of the fattener. Two meals of the coop-fattening mixture are given daily, and any surplus is removed half an hour after each meal. Healthy chickens will increase in weight from 1 to 1½ pounds during the three weeks of fattening.

If it is desired to turn out first-quality birds, it is necessary to cram after the first ten days of trough feeding. This is a job for the expert, as great care and good judgment are needed during the cramming period. The food for cramming should be so prepared that it resembles thick porridge, and a useful mixture is 95 per cent. of Sussex ground oats and 5 per cent. of dried milk.

PROSPECTIVE STOCK COCKERELS.—If the poultry-keeper is in the habit of breeding his own replacement stock, a number of cockerels will be needed annually. These can be secured from the various matings on the farm, or they

can be hatched from bought eggs. After they have been selected they should be allowed extensive grass runs all through the season until ready for breeding purposes. Their daily rations should consist chiefly of grain, with an occasional feed of wet mash. Good plain food is all they need, and every effort should be made to avoid forcing growth.

HEN-REARED CHICKS.—With reference to chicks reared by broody hens, there is no reason why the same methods of feeding should not be followed. Each coop will have to be provided with small mash receptacles for a week or two, but after this one large mash hopper can be shared by half a dozen broods. Wet mash and grain can be fed in the same manner. Water, grit and shell should be supplied for the chickens and hens, the latter also receiving two good feeds of grain daily.

Chapter 8

CULLING

Periods—Methods—Distinguishing the Culls—Disposal of Culls

Every poultry-keeper should practise culling and make it a part of his general routine. During the past few years a good deal of attention has been given to the subject, and it has played a very important part in raising the standard of present-day flocks. At one time it was customary to leave the whole of the flock intact throughout the year, removing only the ailing specimens. This meant that thousands of birds were kept at great loss to poultry-keepers, as occasionally it was found that some had never laid a single egg, while others laid only a few in the summer months, and yet they consumed just as much food as the good producers.

Culling can be undertaken successfully by any intelligent poultry-keeper, and, although at the outset it may seem rather a difficult task, one can soon become expert at the job. All that is necessary is to spot the culls and remove

them from the flock. In addition to the removal of non-layers, there is an opportunity to cull any bird showing signs of disease. In this way culling serves a twofold purpose. This can be done on all well-managed farms without lowering the daily output of eggs.

The percentage of culls will be governed to some extent by the quality of the parent stock and by general management. If the flocks to be culled are well bred and properly sorted out in the autumn, when placed in their respective houses, there should not be many culls to deal with, but on farms where little attention is paid to these points they may exceed 50 per cent. of the total flock.

CULLING PERIODS.—Although I am inclined to suggest that culling should be a daily job, it is obvious that it cannot be done with such regularity. There are three important periods of the year when culling should be undertaken, these being early in January, in April, and after the end of the laying year, in August or September. Although these are the best periods, there is no reason why it should not be done monthly if the time can be spared. There is no object in retaining a single bird once it has ceased to be profitable.

The first-mentioned culling enables the

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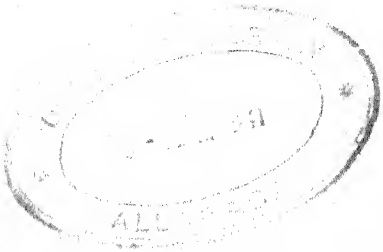
HEAD OF A GOOD LAYER.



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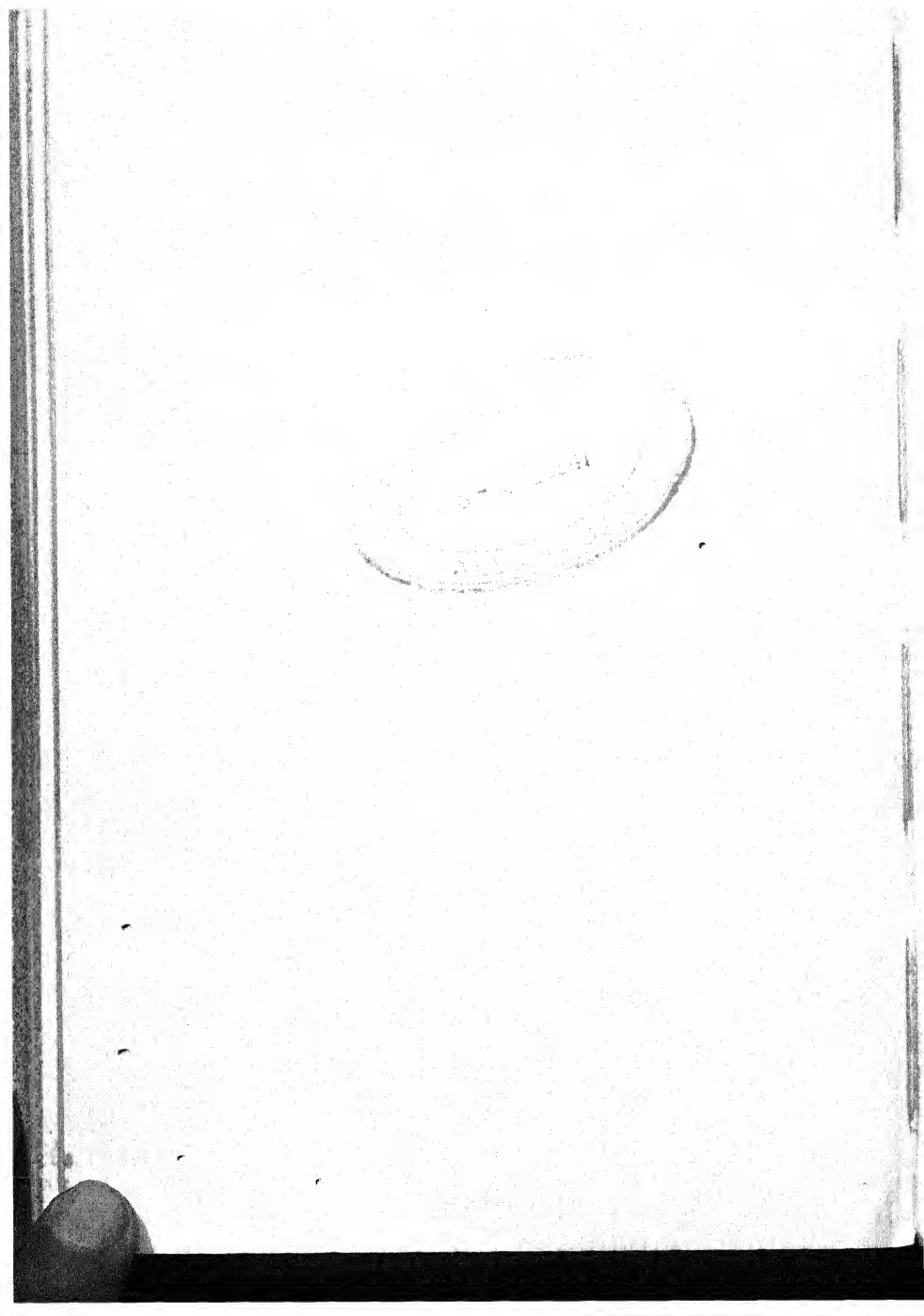
HEAD OF A POOR LAYER.



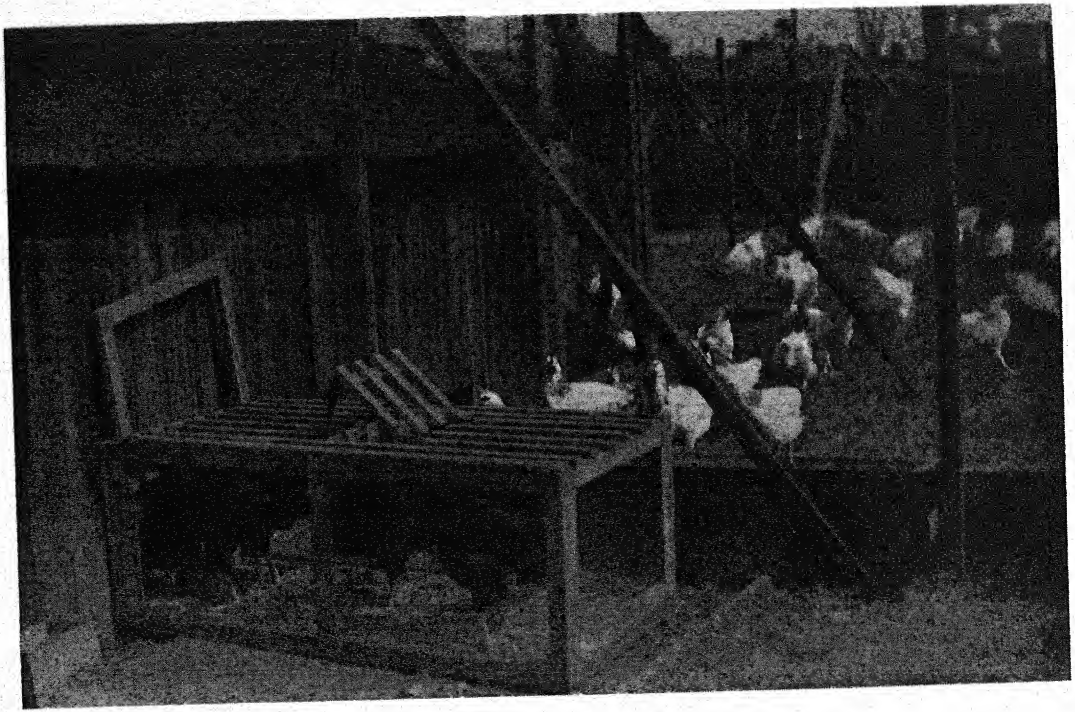
autumn sluggards to be detected, those birds which for some reason have failed to produce during that part of the year when eggs are dear, October to January. If the pullets are properly selected, there is no reason why they should not lay in the autumn, but if they have not produced any eggs by January they should be removed. The second period suggested is some time during the month of April, when it is an easy matter to recognise the poor producing specimens, roughly six months after selection. Any doubtful birds which escaped at the first culling should be reconsidered at this period.

The importance of culling at the end of the laying year depends on the objects of the poultry-keeper. If there is to be a selection of the best birds for future breeding purposes, then it must be done carefully. On the other hand, if the majority of the birds are sold annually to make room for pullets and only a few are kept for winter laying, the matter is not so important.

METHODS OF CULLING. — Most poultry-keepers will have their own particular method of dealing with the work, but I have a preference for the following system. I like to do the job as soon as possible in the morning, bearing

in mind that the birds are then already confined to their houses. The culler will find a catching-crate most helpful, a useful size being 4 feet long, 2 feet wide and 2 feet high, with a movable end and a trap-door at the top. The crate is placed outside the exit, a score or so birds are driven in, the end is closed, and the birds are ready for inspection. In the course of time it will not be necessary to handle every bird, as the layers will be easily distinguished from the others. Sometimes there are specimens which possess all the good points and yet fail to lay; in such cases handling is essential. Some poultry-keepers cull at night whilst the birds are on their perches, but I much prefer seeing them in action, so that their general health can be studied. Crates will be needed in readiness for the culled birds, the grading for condition being carried out at the time of culling.

DISTINGUISHING THE CULLS.—When the birds are being examined attention should be paid to head points, including comb, eye and texture. The comb of a good layer will be bright and velvety to the touch, and it may be above the average size for the breed. A dull, shrivelled comb denotes that the bird is out of condition, and a decision must be reached



CATCHING-CRATE, IN POSITION.

whether to cull it or not. Eyes should be bold and bright and not abnormal in any way; wall-eyed specimens and birds with split pupils should be culled.

The next part of the body to consider is the abdomen, and this should be soft in texture and well developed. A bird with a hard abdomen, or having little or no capacity for egg production, should be looked upon with suspicion. The vent of a good layer is moist and large; that of a non-producer is small and puckered. A good layer has straight, thin pelvic bones; a poor layer has these bones well covered with flesh whatever their shape. Birds in lay have a three-finger space between the two pelvic bones, and when out of lay only one-finger space. Sometimes odd birds have the appearance of laying and yet never produce a single egg. If there is any doubt about them, the finger test should be applied to the pelvic bones.

The following additional hints should make things easier for those who keep yellow-fleshed breeds such as Wyandottes, Rhodes and Leghorns. All yellow-fleshed birds possess a certain amount of pigment in their bodies, which varies according to the laying qualities. For example, a Rhode Island Red pullet will, or

should, have bright yellow legs and skin, a yellow ring around the eyelid and around the vent. In course of time much of this pigment disappears and is absorbed in the system or in the eggs, the time and rapidity of absorption depending on the laying qualities of the bird. A poor producer will retain most of the pigment all through the year, whilst the good layer will lose it in three months. Any bird showing strong colouring after about three months should be regarded with suspicion. Good layers will often take a rest or go into a moult, in which case the pigment returns during the interval. From the description given it should be possible to remove the worst offenders, but doubtful specimens should be placed in a house for observation for a few days prior to selling.

DISPOSAL OF CULLS.—There is a steady demand all through the year for culled hens and pullets, but they must be in good body condition. Local requirements should be studied, as it is cheaper to sell locally, and very often prices are higher than in other markets. As a rule it does not pay to fatten culled birds, and if they are in good condition there is nothing to gain by it. It may be possible to sell them alive to poulterers. A higher price should be

obtained for pullets than for hens. Grading is advocated, so that the highest price can be obtained for the best birds. If good, bad and indifferent specimens are put in the same crate, the buyer will pay only a medium price for the lot. The birds should be starved for a time before being sold, in order that they may free their crops of food.

Although the above remarks are directed towards the culling of adult stock, it should be remembered that it is just as important to cull right through the chicken stage. The removal of all undersized, weakly specimens from the groups will lessen the work later on, and in the end provide a healthier and a more productive flock of pullets.

Chapter 9

DUCKS AND GEESE

Ducks: *Best Breeds for Eggs and Table—Feeding Adult Stock — Incubation — Rearing — Feeding — Fattening — Rations*

Geese: *Breeds—Hatching and Rearing*

Although ducks and geese are being dealt with in one chapter, this does not necessarily mean that they are of little importance to the poultry-keeper. Nevertheless, it must be admitted that there is not the interest taken in them that there might be. In the past they have occupied a back seat in the poultry industry, but there are signs of their promotion.

DUCKS

Ducks are more suited to the general farmer than to the small poultry-keeper, and it is not often that they are found in any great numbers except on the general farm. In order to get the best results from them, they should be allowed their liberty over meadows and low-lying pastures, where they will secure their

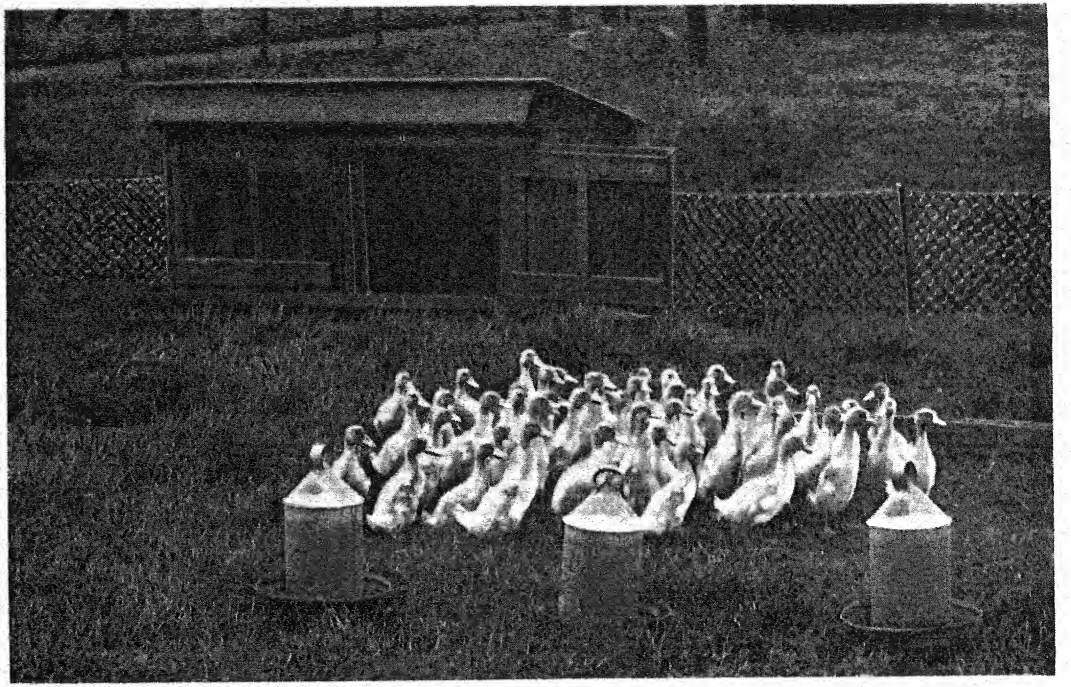
own living to a great extent. Smallholders and backyarders are handicapped in regard to space, but this need not prevent them from keeping ducks. Excellent results can be obtained from small flocks kept in confined runs, but feeding costs are higher than they would be if range conditions were available.

Some poultry-keepers object to keeping ducks for egg production, on the grounds that there is little demand for their eggs and prices are too low to compensate for the extra food costs. This may be so in some districts, but the general public are beginning to realise that duck eggs produced and marketed under modern conditions are far superior to those produced a few years ago by the farmyard flock, and the demand is increasing. Some producers manage to secure twopence per dozen more for duck eggs than for hens' eggs. Buyers should bear in mind that the average duck egg is heavier than the hen's, and that they are thus getting more value.

The duck industry can be divided into two sections—egg production and table duck production. In both sections the treatment of the birds is similar, especially in regard to housing,

feeding and management. Ducks do not require elaborate houses, but, contrary to popular opinion, it pays to provide them some kind of shelter at night. On farms it may be possible to allow them some disused farm building, and in this way reduce the cost of housing. Plenty of fresh air is one of the essential features, and this is not difficult to provide in any type of house. When concentrating on egg production, it is not advisable to exceed fifty birds per unit. For small poultry-keepers half a dozen birds will supply sufficient eggs for an ordinary-sized household.

BREEDS.—With regard to breeds, Khaki Campbell, White Campbell and White Runners are the most suitable for egg production, the Khaki being the best in this respect. If it is intended to keep breeding stock, the birds should be selected in the autumn and mated up well before eggs are needed for incubation. Half a dozen ducks with one drake form a breeding pen, but mass mating can be practised if desired. Swimming water is not essential for the breeders, but they appreciate it, and whenever possible it should be allowed them. March and April are the best months for hatching, and the incubation period is twenty-eight days. Those who are not interested in



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AYLESBURY DUCKLINGS FOR TABLE.

breeding their own can purchase day-old sexed ducklings.

If table ducklings are desired, then the choice of breed should lie between the Aylesbury and Pekin, or a cross between the two. The Aylesbury is the best table breed. These birds carry a large amount of excellent white flesh, and are ready for marketing at nine or ten weeks of age. Birds for stock should have large frames and deep bodies and should weigh not less than 8 pounds. Five females and one drake comprise a pen, and over-year ducks mated to a young drake usually give the best results. Early mating is advocated if ducklings are required for the spring and early summer trade.

FEEDING ADULT STOCK.—The feeding of the adult stock of both laying and table breeds is comparatively simple. As a rule two meals daily are allowed, consisting of grain in the morning and wet mash in the afternoon. Both grain and mash can be the same as used for ordinary fowls, but in the summer it is advisable to reduce the animal protein to 5 per cent. The duck consumes about 5 ounces of food daily, 2 ounces of grain and 3 of mash. All food should be fed in troughs, and water is essential at all times.

INCUBATING EGGS.—When only small numbers of ducklings are needed, the eggs can be hatched by broody hens. A good-sized broody can cover ten eggs and mother the same number of ducklings. The treatment of broodies has been dealt with in a previous chapter.

If incubators are used, the temperature should not exceed 103° F. at any stage. The eggs must be turned three times daily, and cooled for about ten minutes during each of the last ten days. The eggs are usually tested on the tenth day and again on the twenty-first. Plenty of moisture is essential throughout the whole of the incubation period, and during the last week it is advisable to sprinkle the eggs with lukewarm water each day when closing up the machine. Ducklings often take twenty-four hours to hatch out, and the novice is advised not to get impatient if they are a long time making an appearance.

REARING.—The rearing of both layers and table ducklings can be carried out satisfactorily with hens or with artificial brooders. The ordinary adaptable hover is the best appliance for the purpose. It should be placed in a suitable house large enough to hold fifty ducklings; a house 6 feet square would be adequate. It would be necessary to have a boarded floor in

order to keep off rats, which are very fond of ducklings.

The temperature required for the first few days is 85° F., but it should be gradually reduced, so that the hover can be dispensed with by the end of a month. Broody hens are usually kept with the ducklings for three weeks, and after this time several lots can be placed together in one house. Grass runs should be available after the first day or two. Early in the season it may be necessary to provide some form of shelter against wind, and later on in the summer protection from the sun.

FEEDING. — Ducklings require feeding at regular intervals, and during the first few days they consume very little food at each meal. During the first week they should have five meals daily of wet wash, mixed to a moist, crumbly state and fed in small troughs, and water in shallow vessels, the quantity being increased as the ducks develop. During the next three weeks the number of meals can be reduced to four daily, and after a month to three meals a day, up to the eighth week.

At the eighth week the sexes of the laying varieties should be separated, but it is not necessary to do this with table ducklings, because all the birds are intended for the market.

Sexing is done by holding up the ducklings by the neck and supporting the hindquarters lightly with the other hand; the females give off a distinctive quack and the drakes utter a harsh shrieking noise. If there are any doubtful cases, they should be placed with the ducks for another week or two and then tried again. When the sexes are separated, the females should be allowed their liberty and fed twice a day, grain in the morning and mash in the evening. This routine is continued until the autumn, when they are old enough to receive adult rations and the treatment advised earlier in this chapter.

Egg-laying breeds are nervous and require careful handling at all times. Several weeks before the young ducks are likely to lay they should be selected and placed in their permanent quarters in order that they may have time to settle down. Ringing and any other work necessary for their welfare should be attended to at this stage.

FATTENING.—Although the drakes of the egg-laying breeds are not considered good table birds, they develop into plump, saleable specimens if properly fattened. There is no difficulty with the Aylesbury or with other table varieties, but they must be ready for

market by the end of the tenth week. After this period they moult and lose much of their flesh, requiring another six weeks' feeding to bring them back into saleable condition. From the eighth to the tenth week it is advisable to give three meals of wet mash daily, allowing them all they will eat at each meal and removing any surplus. When available, separated milk can be used in place of dried skim milk. During the final fattening period the ducklings should be kept well littered with clean straw, in order to protect the flesh and feathers.

RATIONS.—The following mixtures are recommended for ducklings intended for egg or table production at various stages of growth. (All parts by weight.)

MASH FOR FIRST WEEK.

Equal parts of fine biscuit meal, weatings and Sussex ground oats. Scald the biscuit meal and add the other meals so that they form a moist, crumbly paste.

MASH FOR NEXT SEVEN WEEKS.

	Parts.
Bran	2
Sussex ground oats	2
Weatings	4
Maize meal	1
White fish meal	1

MASH TO BE FED AFTER THE EIGHTH WEEK TO DUCKLINGS INTENDED FOR EGG PRODUCTION.

	Parts.
Bran	3
Weatings	3
Maize meal	2
Sussex ground oats	1
White fish meal	½

FATTENING MASH TO BE FED FROM EIGHTH TO TENTH WEEKS.

	Parts.
Weatings	2
Maize meal	2
Barley meal	2
Sussex ground oats	1
Dried skim milk	½

GRAIN RATION.

	Parts.
Wheat	2
Cracked maize	1

All mashes should be mixed to a moist, crumbly state.

GEESE

Geese are essentially a table fowl, and for hundreds of years they have formed an important part of Christmas fare. A few years ago there was a good sale for goslings in the summer and at Michaelmas, but the demand at these periods is now very limited. They are certainly not so popular as turkeys, but there

is a tendency towards a rise in the number of geese kept, and the demand for them at Christmas is increasing.

Geese are very much at home on the general farm, where they can enjoy their freedom and secure a large proportion of their own food. Commercial poultry-keepers sometimes keep them for grazing small grass runs. Years ago it was a familiar sight to see flocks grazing on common lands, and many of these birds belonged to small poultry-keepers, who used to drive them to and from the common daily.

BREEDS.—Those who intend to keep geese will find the Roman and Chinese varieties very suitable for general purposes. There is no great demand for the 20-pound specimens these days; with smaller families and the miniature ovens of modern houses it is impossible to deal with large birds. The 12-pound goose meets with a ready sale, and the varieties mentioned will provide the size needed.

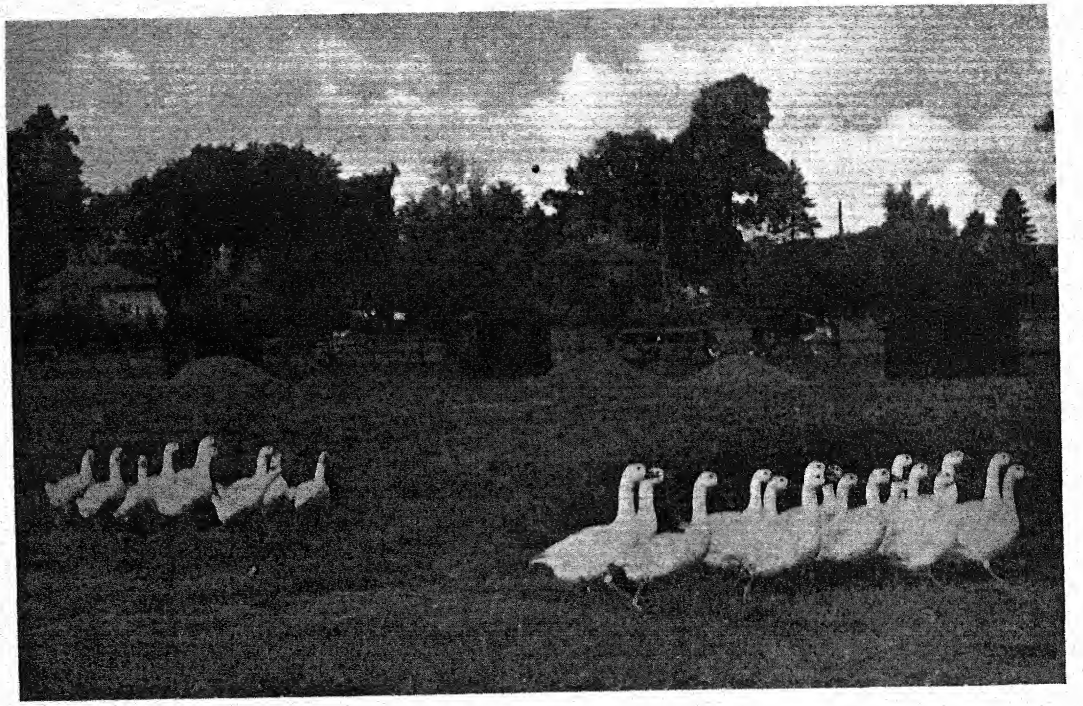
Those who prefer to keep their own breeding flocks should select good-bodied specimens, over-year females being the best for the purpose. Geese live for many years, but after five or six years they fail to produce early eggs. Young ganders should be mated to older geese, and half

a dozen females to one male is the usual number allowed. The stock selected should be mated in the autumn in readiness for early spring hatching. There is no need to provide any special type of house for them, and on farms where there is no risk of foxes they need not be housed; nor is swimming water essential for the breeding flocks.

HATCHING AND REARING.—Hatching is more satisfactory when done by broody hens. Geese go broody at times, but the ordinary hen is preferable both for hatching and rearing purposes. If the geese are allowed to incubate their own eggs early in the spring, they are not likely to lay another batch of eggs until late in the season. If incubators are used for hatching, the same management as for hatching duck eggs is advised.

Goslings are easy to rear and require little attention at any time. They can be brooded by hens or under adaptable hovers. Heat is needed for two weeks only, and in the late spring a week is quite long enough. The treatment all through the rearing period is the same as for other varieties of waterfowl.

With regard to feeding, the same foods already recommended for ducklings can be used up to the eighth week. After this period



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ROMAN GOSLINGS ON FREE RANGE.

two feeds of grain daily will suffice if they can have access to grass. After harvest they should be allowed their liberty on the stubbles until the end of September, when the final fattening period commences. From October onwards they should be allowed two good meals daily of the mash mixture advocated for fattening ducklings. Up to 20 per cent. of boiled potatoes can be added to the mash. It is not advisable to confine the goslings entirely during fattening; they can be allowed their liberty during the daytime, but should be housed at night.

CHAPTER 10

TURKEYS AND GUINEA-FOWL

Importance of the Turkey Industry—Housing—Suitable Breeds and Management—Incubation and Rearing—Rations—Fattening—Guinea-Fowl on the General Farm—Management

TURKEYS

THE breeding of turkeys for commercial purposes has developed enormously during the past ten years, but in spite of this large numbers are still imported every season. For hundreds of years the turkey has been recognised as the leading bird for Christmas festivities, and although the goose has striven for supremacy, it has not yet succeeded in making any great headway. There is still plenty of scope for increased production at home, and English producers should take full advantage of this opportunity.

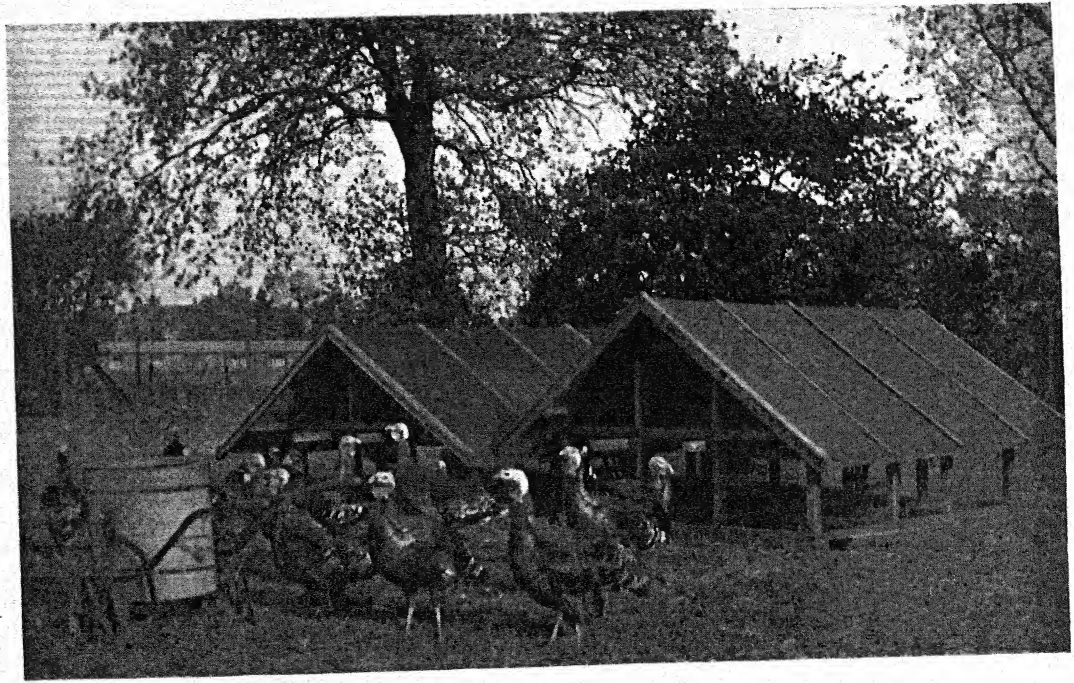
It is rather curious that the turkey should be looked upon as a breed of fowl to be reared for one object only, the Christmas market. Whilst admitting that the chief trade will always be at Christmas, I see no reason why turkey meat should not be eaten at other

periods of the year, as is done in the United States. There is, of course, the difficulty in securing hatching eggs, but by selection and breeding it should be possible to evolve strains which will lay more eggs earlier or later in the season.

During recent years the demand for smaller turkeys has increased, and efforts are now being made to supply birds within the limit of 10 to 16 pounds. The production of such birds should tend to encourage greater consumption and at the same time bring the turkey within the means of many customers who, in the past, have not been able to afford this luxury. There is ample proof that excellent turkeys of all weights can be reared intensively, and for the past few years large numbers have been so raised by poultry-keepers who, at one time, were under the impression that free range was an essential factor. The results obtained from experiments have proved that it is within the scope of smallholders to adopt the intensive system with advantage. On farms where Blackhead disease is troublesome it is very difficult to rear turkeys by ordinary methods with any degree of success, but the intensive system provides a means of controlling the disease and securing satisfactory results.

HOUSING.—The general farmer plays an important part in the production of the thousands of birds needed for the trade. Naturally, there are some districts where rearing is difficult, owing to the nature of the soil, or through the presence of Blackhead, the disease known also as Spotted Liver, which is responsible for a heavy mortality every season. When facilities are available, however, the birds should be reared naturally. Heavy types of soil are not good, and this point should be borne in mind when a decision has to be made. Turkeys are very fond of their liberty and do not appreciate stuffy, cramped quarters. Open-fronted houses should be provided for the breeding stock, and if these are not available it may be possible to allot them a section of a cart-shed or some disused farm building. If the birds could have their own way, they would prefer to make use of more natural conditions, such as trees, open sheds and the like. The turkey is a very good forager and loves to ramble in woods, and if foxes are not about it should be given every opportunity to forage in this way.

BREEDS.—Many turkey-raisers keep their own breeding stock, whilst others prefer to purchase eggs or day-old turkey chicks. Fortunately, there is no difficulty in obtaining



TURKEYS IN SUMMER RANGE SHELTERS.

supplies, and it is sometimes more convenient to purchase them than to breed, particularly where the land is unsuitable. In the latter case intensive methods of rearing would have to be adopted.

The choice of breeds is rather limited, but the existing varieties are good and suitable for the purposes required. The four chief varieties are American Mammoth Bronze, Cambridge Bronze, White Austrian or Holland, and Black Norfolk. There is a Canadian breed called the Charlevoix, very similar in size and character to the Black Norfolk, but stock is very limited in this country. The first three varieties are excellent for the production of birds weighing from 16 to 30 pounds, and the Black Norfolk is most suitable for the small meaty specimens already referred to. If a cross-bred turkey is desired, the Black Norfolk and American Bronze cross provides an excellent type of bird.

SELECTION OF STOCK.—Most breeders prefer over-year hens, and it is generally agreed that they are best for breeding purposes. Females up to the age of five years are often kept, but there is a tendency for them to lay later each year, a point to be considered when early chicks are needed. This does not mean that young females cannot be used for breeding,

and providing they are early hatched and well developed I see no reason why they should not be mated. In all cases the females should be heavy and good conditioned, possessing depth of body and straight, long, deep breasts, free from any deformity.

The males must have similar qualities. It is better to use young males each year. There is always a tendency for them to increase in weight the second season, sometimes to such an extent that they are unable to function properly. The selected males should be early hatched, and birds scaling about 20 pounds are ideal for the purpose.

With reference to mating, one male can run with eight females, and they should be mated not later than the end of January. One can allow twice the number of females if the male is kept apart from them until they show signs of mating, at which time the females should be taken to the males. It is said that one visit from the male is sufficient to fertilise a batch of eggs.

NESTING.—With ordinary luck eggs may be expected in March or April, and as the hens prefer to select their own nests in hedgerows, woods, stacks and other secluded spots which appeal to them, it is advisable to keep a

watchful eye on the flock when they show signs of laying. The desire to mate with the male suggests early laying, and the restless condition, together with the continuous squatting attitude of the hens, is a good sign. Very often they can be encouraged to lay at home by the provision of a few "natural" nesting-places. Many turkeys are persistent layers, and some will produce from thirty to sixty eggs without a break.

INCUBATION AND REARING.—Hatching can be successfully accomplished by artificial or natural methods. The period of incubation is twenty-eight days, and there is no need to depart from the methods already outlined for duck eggs. Early testing for fertility is advised in order to make sure that the matings are satisfactory. Rearing is not a difficult matter, certainly not the laborious task so often imagined, and either brooders or broody hens can be used. In cases where large numbers have to be raised artificial methods of brooding are recommended, adaptable hovers being suitable for the purpose. The size of each unit during the brooding period should not exceed eighty. Heat is essential for about six weeks in the early part of the season, but later in the year a month is sufficient. Brooder tempera-

ture should not exceed 85° F. during the first week, and can then be gradually reduced.

If intensive rearing is practised, it is advisable to provide wire-floored sun-parlours so that the youngsters can enjoy the sun and air. When the turkeys are reared outside, grass runs should be available all through the brooding stage with free range to follow. Turkey chicks require double the space needed by ordinary chicks, and when they are kept intensively the following spaces should be allowed :

FLOOR SPACE PER BIRD.

Day-old .	. 1½ square feet.
One month .	. 3 ,, ,,
Two months	. 4 ,, ,,
Afterwards .	. not less than 6 square feet.

When rearing with a view to allowing the turkeys extensive range, they should be moved from brooders when eight weeks old and transferred to suitable houses, the groups not exceeding fifty. The ground used must be clean and kept free of ordinary poultry. The floors of the houses should be littered with a good supply of peat-moss until the birds show a tendency to perch, when less will be needed. Some breeders object to early perching on the ground that it encourages crooked breasts, and

although this may be true in some cases the use of cod-liver oil in the rations, together with the necessary quantity of mineral matter, will reduce this risk. If hen-reared birds are being provided for, it is a good plan to allow a docile "mother" to run with a group of chicks all summer. This will encourage them to "home" at night, and it will save much time in rounding up the flock. Turkeys love stubble land, and every opportunity should be afforded them to roam over the fields after harvest. When this "luxury" period is over, the birds should be brought nearer home and fattened, the fattening period being from October to Christmas.

Feeding Methods and Rations.—The following rations and methods of feeding are advised from shell to marketing stage. Many breeders give grain and wet mash, others give grain and dry mash, while some prefer either mash or pellets. Very few now go to the trouble of boiling eggs and baking puddings for them, as it has been found unnecessary. There is no "best system" of feeding; if the stock are healthy, they will thrive irrespective of method.

MASH RATION FOR FIRST TEN WEEKS.

(All parts by weight.)

	Parts.
Weatings	6
Bran	4
Maize meal	4
Sussex ground oats	2
Alfalfa meal	1
White fish meal	1
Dried skim milk	1
Cod-liver oil 1 pint, Common salt 1 pound	per 100 pounds of mash.

MASH RATION FROM TENTH WEEK TO FATTENING STAGE.

	Parts.
Weatings	6
Bran	4
Maize meal	4
Sussex ground oats	2
White fish meal	1
Cod-liver oil 1 pint, Common salt 1 pound	per 100 pounds of mash if confined.

GRAIN FEED.

Same as for ordinary chickens.

These mashes can be fed wet or dry. Only small quantities should be given at first, five times daily, the amount being gradually increased. After the first week four meals daily will suffice up to the third month, then three meals daily till the fattening period. All food should be given in troughs, which are kept

clean and moved on to fresh ground daily. A plentiful supply of water, grit and shell must be provided.

FATTENING.—During fattening it is usual to allow three meals daily in the early weeks and two meals daily for the rest of the period. I like wet mash best, but some turkey-raisers allow a certain amount of grain as an additional feed. It is a common practice to soak the grain three or four hours before required. When wet mash is used, it is safe to introduce up to 20 per cent. of boiled potatoes. The turkeys must be given all they care to eat at each meal, any surplus being removed. It is important to keep the turkeys clean during the fattening period and to avoid using high perches. The birds are apt to damage their breasts when dropping to the floor from a high perch.

GUINEA-FOWL

Guinea-fowl are not general favourites, but small flocks of them are kept on some farms. I often wonder why more are not bred, because there is a demand for these birds in the spring when ordinary fowls are scarce. There is little trade for them at any other season, however, but this may be due to old-time fashions.

They are peculiar creatures, preferring to roost outside and often in the highest tree. They have a wonderful "ear", and have often been referred to as the farmer's watchdog, because the presence of a fox, dog or human being sets them off at dead of night with their persistent call, "Come back, come back, come back". The noise has a startling effect on those who do not understand the peculiarities and whereabouts of the birds. There is no need to provide houses for guinea-fowl, as they love their freedom and the open air. I have seen them, however, apparently enjoying themselves under unnatural environment in enclosed runs.

The two common colours are Speckled and White, but there are several fancy varieties kept for ornamental purposes. The males and females are alike in colour, but the male has larger and brighter headgear and is also larger in the body. The hens are also recognised by the noise they make, "Come back", while the males utter a harsh shrieking sound. A male usually mates with three females. The hens prefer to select their own nests in hedgerows and other secluded spots, and this makes it very difficult to locate their eggs. The eggs are dark brown in colour, peppered with

lighter-coloured spots, and they are looked upon as a luxury, finding a ready sale during the spring and summer months, the real season of production.

Hatching, which takes twenty-eight days, and rearing are best undertaken by broody hens. After hatching it is as well to keep the broody hens confined to the coops for a month, so as to enable the chicks to get strong and ready to forage for part of their living.

The actual feeding of the youngsters need not differ very much from the ordinary methods followed for chickens on the farm. For the first few days I advise giving them biscuit meal, scalded and dried off to a crumbly state, with Sussex ground oats, allowing five meals daily and as much as they will consume at each meal. After this period they can have ordinary chicken rations.

It is advisable to keep the youngsters dry during the early period, and when ready for their complete liberty to let them have it without any restrictions.

Chapter 11

MARKETING THE PRODUCE

Eggs—Table Poultry—Hens—Ducks—Geese—Turkeys—Hatching Eggs—Day-Old Chicks—Growing Stock—Stock Cockerels—Adult Stock—Manure—Feathers

It is useless attempting to produce the commodities already specified in the various chapters of this book unless a serious effort is made to secure a market for them. Unfortunately, this is not always realised, with the result that profits never reach the figures anticipated at the time of planning operations. The marketing side of the industry has presented very difficult problems, but there are various recognised channels for the goods to pass through, and poultry-keepers are advised to make the fullest use of them. In quite a number of cases there is no difficulty at all, when private customers can be found to take most of the eggs and table poultry produced. It saves much time and worry to have contented, reliable, private customers, and usually the prices secured compare favourably with those obtained from other sources. I am of

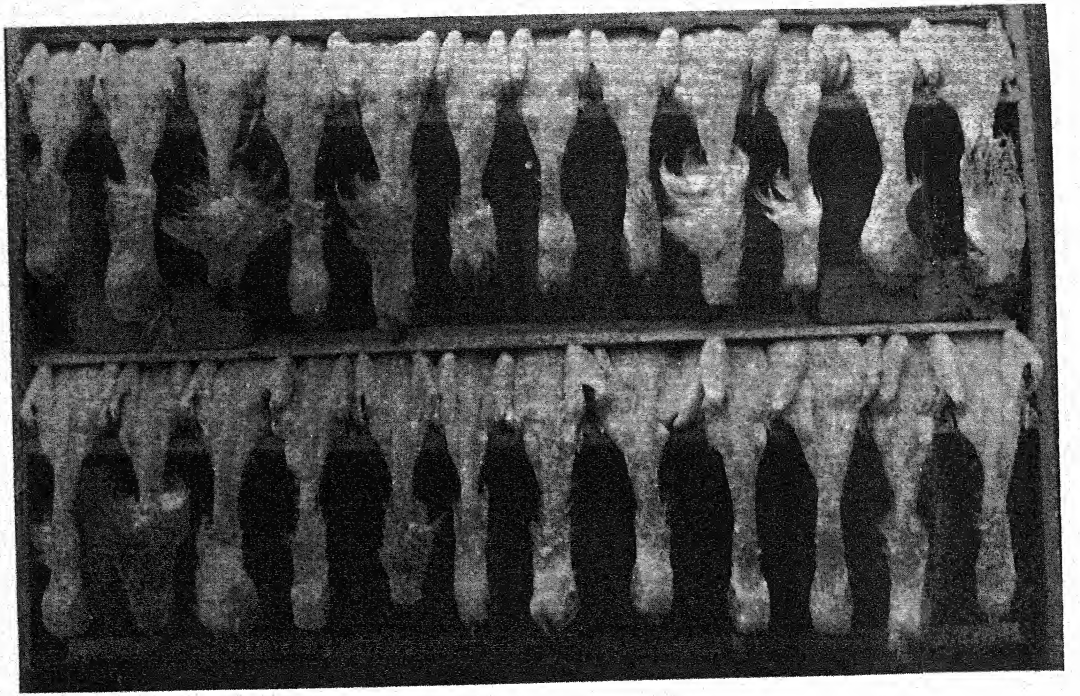


TABLE CHICKENS IN SHAPING TROUGHS.

the opinion that every effort should be made to market locally, and only if this fails should alternative outlets be sought.

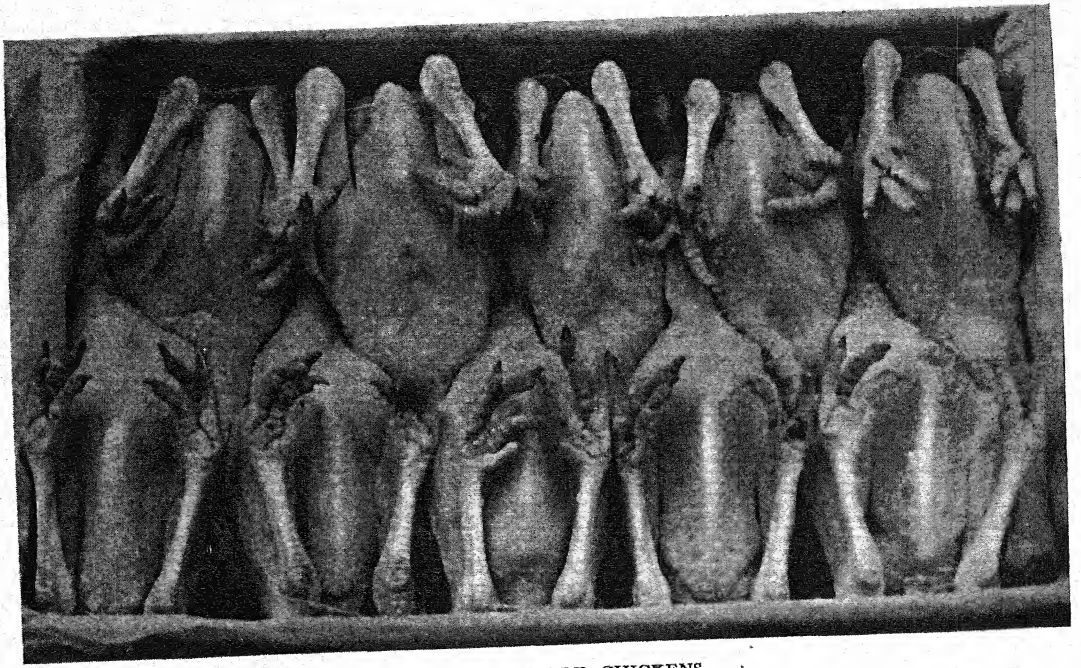
MARKETING EGGS.—With reference to the disposal of eggs, there are various National Mark Packing Centres in different parts of the country which merit careful consideration. It may be that on occasion better prices can be secured through other means, but in the main National Mark prices compare favourably with other market prices. These centres are prepared to consider the whole output of a farm, so long as the eggs are graded.

Eggs should be marketed fresh and in a clean state. If they are dirty, they must be washed and allowed to dry before packing. It is not good policy to include in a consignment eggs which have been gathered from hedgerows and other secluded spots, unless their age can be guaranteed. There is always the risk of packing a stale egg or two, and these are certain to be detected, with the result that a good customer may be lost. Eggs should be graded at the time of packing, and during the period when large quantities of pullet eggs are being collected it is important to see that these are placed in the correct grade. The practice of holding up supplies in order to

secure an extra shilling or two never really functions satisfactorily. Special attention should be given to the boxes and fittings used for packing purposes, particularly as regards soundness and cleanliness.

TABLE POULTRY.—There are several methods of marketing table poultry, and producers must consider how they can best obtain the maximum net return. If only small numbers are being produced periodically, it may be possible to find local customers for them. There is also the possibility of working up a dressed poultry retail trade, but this involves extra work in preparation. It may not always be a feasible undertaking, but as a rule the extra price secured more than pays for the trouble. Difficulties may sometimes arise in securing competent labour.

The birds may be disposed of either before or after fattening, and when labour is scarce or space limited the former course is to be recommended. There are quite a number of buyers of unfattened chickens, but they require birds in good body condition, suitable for the fattening coops. If it is intended to fatten some of them before selling, only first-class specimens should be put into the coops. In both cases it pays to grade the birds for size,



A PACK OF TABLE CHICKENS.

quality and colour of flesh. Consignments destined for the salesmen should be even and well packed, in crates suitable for the purpose.

In cases where the birds are to be killed and sent away in standard packs of six or twelve birds, care should be taken to choose even lots. They should first be starved for twenty-four hours and then killed by dislocation of the neck, plucked and stubbed, and the legs and feet washed. After this they should be allowed to cool thoroughly before packing. Special boxes can be purchased for this work, and the packing must be well done. As a rule the material used consists of clean wheat straw and grease-proof paper. Small quantities of straw are placed on the bottom of the box, followed by a layer of grease-proof. The chickens are placed on the paper in two rows with heads doubled back and legs pushed down breastwards, the heads of the two rows of chickens meeting down the centre of the box. Another layer of paper and straw is placed on top and the lid fastened securely. Consignments should be despatched in time to reach the markets in the early morning.

OLD HENS AND MALES.—When poultry-keeping is carried out on businesslike lines, about three-quarters of the pullets should be

marketed at the end of the laying year. In order to avoid congestion the marketing can be spread over several weeks. There is a good trade for old fowls at certain seasons of the year, and one should become acquainted with the markets and arrange for supplies to be sent. Local buyers are always keen to secure large fat hens, and when plucking and rail charges are considered the price realised is equal to that obtained from other sources. It is useless attempting to market poor specimens; the price paid for them often does not cover the cost of carriage.

DUCKS.—As previously stated, table ducklings must be marketed by the end of the tenth week, otherwise they lose condition through moulting. There should be opportunities to dispose of small quantities of well-fattened ducklings to local poulterers or to private customers, but when large numbers are dealt with, other methods must be tried. Ducks take longer to pluck than chickens, and that is why I prefer to market them alive. If they are to be killed, plucked and packed, the greatest care must be exercised in this work.

GEESE.—Geese are often marketed alive at Christmas, and it is a common sight to see large consignments in the local auctions at

this period of the year. It may be possible to dispose of small groups in the same manner as with other poultry, but plucking is a laborious task and should be well considered beforehand. In all cases where the birds are sold alive or dead to local buyers, the price is usually fixed at so much per pound.

TURKEYS.—The disposal of turkeys is not always an easy task, owing to the uncertainty of prices of this class of poultry. As a rule prices remain low for a while, too low for the seller to accept; consequently, he is unable to strike a bargain with the freedom that he has with other classes of fowl. Prices are also influenced by imported birds and by the supplies from home sources. There is a small trade in meeting local demands, but when several hundreds, possibly thousands, are to be sold it is a question of looking round for large buyers. London buyers require birds to be killed and plucked, whereas local auctions will take them alive. In all cases grading is advised at the time of marketing. Should there be any demand for stock birds from the various flocks, these should be picked out before any are sold for table. Naturally, only the best specimens are suitable for this purpose, and prices must be adjusted accordingly.

When large numbers of fattened birds are to be disposed of locally, it is advisable to make enquiries at least a month before Christmas. Orders can be booked with the proviso that the price is to be fixed at a later date.

HATCHING EGGS.—Those who cater for this class of trade usually have their own rules regarding the sale of hatching eggs. A sitting consists of a dozen eggs, and it is customary to replace infertiles once, if they are returned for inspection in a proper egg-box. Some breeders prefer not to replace infertiles, and either quote a special low price or sell fifteen eggs to the sitting. Where large numbers are sold in one consignment, such as a hundred or more, it is customary to quote a special price and send extra eggs, roughly twenty to the hundred, and not replace the infertiles. The larger the quantity sold to one customer, the lower the price should be. The vendor should not be too particular about sending a few extra eggs when replacing infertiles, as this treatment appeals to the buyer. The packing of hatching eggs should be done with the greatest care, and only proper egg-boxes should be used. The expert packer may be able to make a sound job by using any ordinary type of box, but the railway companies will

not accept liability unless sectional egg-boxes are used. Suitable materials for packing include soft meadow hay, chaff, sawdust and fine peat-moss; bran is expensive, but it is often used. Certain makes of boxes require no packing material, but a few handfuls of dry sawdust scattered amongst the eggs will make them doubly safe. Hatching eggs should not be sent by post.

DAY-OLD CHICKS AND DUCKLINGS.—The disposal of day-old chicks and ducklings is often associated with the hatching egg trade, but the large hatcheries confine their efforts to the sale of the "hatched article". Day-old is a term applied to any variety of fowl taken direct from the incubator and despatched within twenty-four hours of hatching. Special boxes are available for this purpose, and vary in capacity from one dozen to fifty chicks. A consignment of fifty will travel better if divided into two lots. When ready for despatch, the chicks should be packed in a box lined with soft hay and securely tied. They should be sent by train, and services involving long waits at junction stations should be avoided as far as possible.

As a rule small poultry-keepers only hatch to order, but large hatcheries produce a

definite number weekly, disposing of them to regular customers. Whether selling large or small quantities, it is good policy to send only first-class chicks and to replace any dying on rail. Sometimes a customer will experience a period of bad luck through no fault of his own, and then an extra dozen will be appreciated and the customer retained on the books.

GROWING STOCK. — The trade in three-months-old pullets is developing considerably, and every order booked should receive attention about the date specified for delivery. The packing of large consignments should be done with care, and not more than two dozen birds should be crated together. A good feed of grain and water should be given to the birds before packing. Livestock travel best at night, and in the case of long-distance orders they should be despatched by an evening train so that they arrive early next morning.

STOCK COCKERELS.—Stock cockerels should be well selected and be worth the price demanded. It is helpful if the buyer is supplied with particulars of pedigree, date of hatching and any other information likely to be of interest to him, especially the system of feeding to which the birds are accustomed. Birds with deformities of any kind should not be sent, as

they will not be accepted by those who know their job, and it is unfair to those who do not. A friendly note to the purchaser posted a day or so ahead of railing, giving time of departure and station to which the birds are being sent, will be much appreciated. A good bird should never be sent away in a dirty-looking box; it is far better to use hampers designed for the purpose. All birds should be sent on forty-eight hours' approval, the usual terms being the return of the birds within this period, carriage paid, if not approved.

ADULT STOCK.—The demand for adult stock is usually in the autumn months, when mated pens and odd specimens are needed, such as a breeding trio or a larger pen, or just one first-rate stock male. In all cases good value for money should be the slogan. Sometimes the customer will give particulars regarding the class of bird required, in other cases the quality is left to the seller. The old adage "to satisfy and serve again" is worth remembering at all times.

MANURE.—It is always a difficult problem to find buyers who really appreciate the value of good poultry manure, and in consequence the demand for it is rather restricted. It is not easy to convince the prospective buyer that it

is valuable, and from a manurial point of view worth five or six times more than ordinary farmyard manure. Market-gardeners and nurserymen realise its true value more than the general farmer, and if a nursery is within a reasonable distance it is comparatively easy to dispose of manure.

As to its actual value, I think this depends very much on the use to which it is put. Horticulturists cultivate intensively and appreciate its value as a fertiliser, and they are prepared to pay a fair price for poultry manure of good quality. I know of certain poultry-keepers who sell all their output at the rate of ten shillings per ton, but I should imagine that the majority receive much less than this.

Farmers should make use of it on the land and credit its value to the poultry section. A common practice is to provide litter to the poultry-keeper and accept the manure as payment. In my opinion this is a bargain in favour of the farmer, and there are many who realise it. The manure from the dropping-boards is much more valuable than that collected from the floor; consequently, the two grades should be kept apart. It is desirable to have a rough type of shed, open in front, for storing the manure, so that it can be kept

from the weather until required for use. Storage provides an opportunity for the weed seeds to germinate, a very important point when it is intended for the garden.

FEATHERS.—Here is another little sideline worth considering by those who make a practice of rearing large numbers of table fowls and disposing of them plucked. There is a demand for good-quality assorted feathers, and buyers are prepared to accept any quantity at so much per pound. As white feathers realise more than those that are coloured, it is advisable to keep them separate. After plucking, the feathers should be stored in thin sacks and hung up to dry before selling. Wing or tail feathers must not be put in the sample; they can be placed in the manure-heap and allowed to rot. A good sample can easily be spoiled if the sweepings from the floor are put into the sacks. It must be remembered that the rate of payment depends on the quality of the feathers.

Chapter 12

DISEASE PREVENTION

Preventive Measures—Disinfecting Land and Plant—Treatment of Common Complaints

This book would not be complete without a chapter on disease prevention. Every poultry-keeper is almost certain to experience some kind of trouble at one time or another, but there is much that can be done to preserve the health of the flock. Fortunately or otherwise, quite a number of the diseases affecting the poultry industry are incurable, and when these have been diagnosed the only questions involved are the disposal of ailing birds and the adoption of measures to prevent a recurrence. It is useless advocating the spending of time and money on the treatment of individual birds in a commercial flock, but when the whole flock is threatened, then the "kill or cure" policy must be adopted.

Naturally, every poultry-keeper is desirous of maintaining a clean bill of health, and frequent culling, together with the immediate removal of any ailing birds from the flock, will

have a wonderful effect. This action in itself will not complete the cure, however; the cause of the trouble must be located, and in order to cope with this problem it will be advisable to seek the services of the County Poultry Instructor, whose job it is to assist in the solving of such problems.

The old saying "Prevention is better than cure" is true enough, but unfortunately of late it has been just as difficult to prevent as to cure. Diseases like Fowl Paralysis, Worm Infestation, Tuberculosis, Coccidiosis, Blackhead, and several others, are most difficult to deal with from a preventive standpoint. Whenever there appears to be more than the average mortality in a flock, efforts should be made to locate the cause. I am not alluding to periodical deaths from ovarian troubles, because these are accidents which will always occur. What I have in mind are cases which appear to have a mysterious problem attached. These should be submitted to a pathologist for post-mortem examination, and future plans will depend on the report. The information from this source is preferable to that of the layman, for in most cases it is necessary to have microscopical confirmation.

There is no doubt that the success achieved

in applying preventive measures largely rests upon the rapidity with which action is taken after serious trouble has been diagnosed. It may call for complete isolation of the rest of the stock or wholesale destruction, but whatever treatment is suggested it should be carried out. It is foolish to seek advice from experts and then fail to act on it.

LIME AND DISINFECTANTS.—The periodical application of lime to land used for poultry is strongly advocated, and the quantity needed will depend on the object in mind. For sweetening purposes a ton of freshly slaked lime per acre is the amount recommended, but in cases where disease has been rampant the quantity should be doubled. It is better to broadcast it when the atmosphere is moist, as it then has a chance to soak into the soil. Agricultural salt is also recommended, the dressing being from 10 to 12 hundredweights per acre. Basic slag has its good properties, and ½ ton per acre is a useful dressing for pastures and poultry runs.

As an extra precaution against disease and the prevalence of insect pests, the houses should be sprayed periodically. Any of the recognised disinfectants can be used, and some of them can be embodied in limewash. For

small appliances such as brooders and incubators a solution of ordinary washing soda, at a strength of 1 pound per gallon of boiling water, is excellent. Every particle of wood or metal to be cleansed must be well scrubbed.

Every poultry-keeper should have an incinerator on the farm, so that all dead birds can be destroyed. It is poor policy to bury them, as rats are likely to unearth the carcases and in this way disease is spread.

COMMON COMPLAINTS

Coccidiosis.—This is a disease of the intestinal tract, caused by small protozoan parasites. There are several species of coccidia, and chickens ranging in age from one week to adult stage are susceptible.

Causes and Symptoms.—The parasites find their way into the intestine and into the cæcum or blind gut, eventually eating away the inner lining. Diarrhœa is one of the chief symptoms, and the droppings are usually yellowish in colour and may contain blood. There is loss of appetite and weight. Post-mortem examination often reveals an enlarged liver and blood in the cæca.

Treatment.—There is no known cure, but in

mild cases the disease can be checked by confining the chicks on wire floors, so that they do not come into contact with their excreta. Another common form of treatment is to confine them for several days, littering the floor lightly with sawdust or peat-moss, and removing it twice daily. This destroys the cycle of infection and enables the chicks to outgrow the complaint. In connection with this method an aperient is advised, such as Epsom salts, allowing 5 ounces per 100 month-old birds, and double the quantity for birds two months old. The salts should be dissolved in warm water and mixed with the mash.

BACILLARY WHITE DIARRHŒA.—This is another incurable disease, and is caused by a bacillus found in the ovaries of diseased adults. It may be passed to a chick through an egg laid by a "carrier" hen, and also from the excreta of diseased chicks.

Symptoms.—Heavy mortality occurs from the second day to the tenth, but fewer deaths take place after this stage. The chicks remain under the heated section of the brooder and become pasted up round the vent with evil-smelling excreta.

Treatment.—There is no cure available. It is best to destroy all the chicks and to disinfect

thoroughly everything with which they have been in contact. Preventive measures are in the poultry-keeper's hands, the chief method being the blood-testing of all breeding stock in order to locate the "carriers", which should then be destroyed.

RICKETS.—This is an ailment of chicks and other young poultry stock, and is most conspicuous amongst birds reared intensively.

Causes and Symptoms.—The trouble is caused by a shortage of mineral matter, vitamin D and sunlight. The symptoms are general weakness, contraction of muscles, lameness, and loss of flesh through inability to secure food.

Treatment.—Add cod-liver oil to the mash at the rate of 1 to 2 per cent. Feed liberal quantities of green food and add 2 per cent. of a good mineral mixture to the mash. The use of sun parlours will assist the birds a great deal, because they will be able to enjoy the full rays of the sun.

CANNIBALISM.—This habit is found amongst growing chicks and adult stock.

Causes and Symptoms.—Some of the main causes are lack of exercise, overcrowding, mineral deficiency, too starchy a diet, shortage of green food and the presence of body lice. It is difficult to name the exact cause, as each

case varies and must be studied separately. The general symptoms are bare patches on certain parts of the body, particularly around the tail.

Treatment.—Remove the cause if known. Give more space. Provide liberal allowances of grass or other succulent green food. If necessary, use insecticide as prescribed. Anoint the pecked parts with Stockholm tar.

FEATHER-PLUCKING.—Same treatment as for Cannibalism.

LICE INFESTATION.—Both adult and young stock are very susceptible, especially those reared by hens.

Causes and Symptoms.—The causes are bad management and poor sanitary arrangements. An examination of the birds will reveal lice around the tail and under the wings.

Treatment.—Apply nicotine sulphate to the perches of all roosting birds half an hour before sunset. Affected birds can be treated by taking a feather from the wing, dipping it in nicotine sulphate and applying it to the feathers around the vent. Allow plenty of ventilation in houses where the nicotine treatment is carried out, otherwise the fumes may cause suffocation.

EGG-EATING.—This is a troublesome habit common to poultry kept in confinement or in restricted runs.

Causes.—The main contributory causes are overcrowding, shortage of nests and nesting materials, lack of mineral matter causing thin shells which easily break, shortage of green food, accidents in nests through an accumulation of broody hens.

Treatment.—Endeavour to remove the ring-leader. Give more floor space per bird and collect the eggs often. Darken the nests and keep them well littered. Supply an abundance of green food. Place plenty of china eggs in the nests.

SCALY LEG.—This is a parasitic disease common amongst poultry which are kept under insanitary conditions. Occasionally it is found amongst the young stock.

Cause and Symptoms.—The trouble is due to a minute parasite, which increases rapidly, hiding away under the scales of the legs. These pests pass from bird to bird at night whilst the latter are on the perches, and dark, old-fashioned houses tend to encourage them.

The general symptoms are roughness of scales, followed by chalk-like growths and lameness. Ailing birds lose flesh and die.

Treatment.—Isolate the birds and wash their legs with hot water and soft soap, removing all dirt from the scales. Apply carbolised

vaseline in mild cases. Bad cases should have the following mixture applied daily: 1 ounce sulphur, ½ ounce oxide of zinc, 1 drachm oil of tar, 2 ounces whale oil.

RED MITE.—This is a greyish-coloured parasite found in the crevices of perches and other sections of house and brooder. It remains in its hiding-place by day, crawling out to attack at dusk. It increases at an alarming rate during summer months, and in a few days after eggs have been laid thousands of these pests are busy sucking the very life-blood out of the birds.

Causes.—Overcrowding, dirty interior conditions and failure to apply disinfectants and creosote to the interior of the houses are the main causes.

Treatment.—Apply a mixture of 1 part creosote and 3 parts paraffin to perches, dropping-boards and any other suspected parts of the house four times a year. It can be sprayed on to the interior walls, but care must be taken to see that every part is dressed. The treatment can be more effectively carried out if all the interior parts of the houses are sectional.

FROSTBITE.—During severe wintry conditions breeds with large combs are susceptible

to frostbite, and this considerably affects the health of both laying and breeding stock.

Causes and Symptoms.—Among the causes are exposure to cold east winds during frosty periods; drinking from open troughs which force the comb and wattles to make contact with the water; roosting outside or on perches which are situated near the roof of the house. The comb turns black, and in large single-combed breeds the spikes have a tendency to drop off.

Treatment.—Dub all heavy-combed breeding males. Apply carbolised vaseline to comb and wattles during a frosty period. See that all birds sleep in their houses and away from draughts.

COMMON COLDS.—Poultry are susceptible to colds at all seasons of the year, and young growing stock often show symptoms during summer.

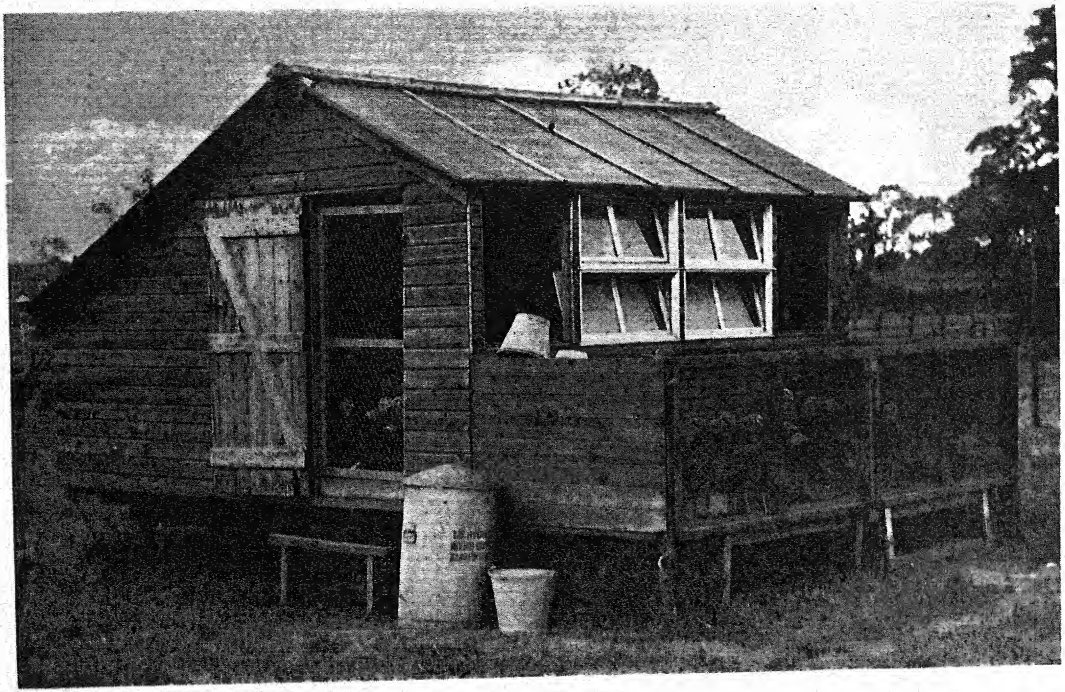
Causes and Symptoms.—Overcrowding, leaky houses, long grass in the rearing fields, poor ventilation of houses, wrong feeding methods, are all likely causes. The common symptoms are watery discharges from the nostrils, thickening as the trouble develops. Patches of mucus will be found under the wings; there is loss of appetite and general debility.

Treatment.—Isolate the birds and remove possible causes. Discontinue dry mash for a time and give wet mash instead. Add disinfectant, such as permanganate of potash, to the drinking-water, using just enough to turn the water pink. Keep the houses clean. Another mixture for use in the drinking-water is: 3 ounces sulphate of copper, 1 ounce sulphate of iron, 1 quart vinegar. Mix and store in a bottle, allowing 1 ounce of the mixture per gallon of drinking-water. It is advisable to use earthen vessels.

BLACKHEAD.—This disease is well known amongst turkey-breeders, and they realise its serious nature. It is a contagious complaint, affecting the liver and intestines. It is quickly fatal amongst young turkeys.

Cause and Symptoms.—The disease is caused by a minute parasitic protozoon, which is found in the walls of the cæca. The liver often shows circular spots of greyish matter, in which are found the same organisms. When ailing, the birds appear listless, appetite fails, resulting in loss of flesh, the excreta become yellowish and death ensues.

Treatment.—The treatment consists in the injection of a specially prepared vaccine into the large vein under the wing. There are



Farmer and Stockbreeder.]

TURKEYS IN INTENSIVE HOUSE, WITH SUN PARLOUR.

several preparations on the market, and these can be obtained from any chemist, together with a special syringe for the task. In the event of any bird in the flock showing the slightest symptoms, the treatment must be applied to all the birds. Delay may result in a heavy loss. If there is any doubt as to how this treatment should be carried out, it is advisable to consult the County Poultry Instructor or the local veterinary surgeon.

IMPORTANT MONTHLY REMINDERS

JANUARY.—Prepare incubators and brooders for use. Obtain supplies of important accessories, such as wicks, capsules, thermometers.

Attend to breeding stock, but do not force production. Guard against frost-bitten combs. Protect eggs from frost. Eggs from heavy breeds can be incubated.

FEBRUARY.—Incubate every available egg from heavy breeds. Overhaul breeding stock. Change males if fertility is poor. Cull laying stock. Watch for broodies. Count chicks and eggs in incubators and incubate more eggs if needed. Protect chicks from cold winds.

MARCH.—Continue hatching heavy breeds through the month. Also incubate light breeds and crosses. Remate heavy-breed hens with light-breed males for first crosses. Spring-clean poultry houses. Keep broodiness in check. Cut off electric light

from laying units. Incubate eggs to produce commercial laying ducks.

APRIL.—Sex January chicks. Fatten cockerels for table. Select prospective breeding cockerels. Continue incubating light-breed and first-cross eggs. Incubate rest of eggs from ducks, also goose eggs. Cull laying flocks. Keep an eye on turkey flock. Preserve eggs.

MAY.—Stop hatching chicks intended for egg production. Incubate turkey and goose eggs. Clean spare incubators. Provide ample space for growing chicks. Continue sexing the chicks. Remove surplus males from pens. Grade breeding and other stock. Dispose of all surplus birds. Examine houses for mite. Sex ducklings when six weeks of age.

JUNE.—Attend to growing stock. Expect eggs from January pullets. Continue hatching turkey eggs. Provide shade when necessary. Examine birds for lice and disease.

JULY.—Discontinue incubation of turkey eggs. Cleanse incubators and store all spare parts. Collect brooder appliances, clean

and store. Allow ducklings and goslings plenty of range. Dispose of some of the old hens from the laying flocks. Prepare for arrival of purchased pullets.

AUGUST.—Cull all laying stock and reserve prospective breeders. If early autumn chicks are needed, force-moult the hens. Examine prospective stock cockerels. Move turkeys to stubbles. Select earliest pullets for permanent laying houses. Refill laying batteries.

SEPTEMBER.—Select breeding stock and blood-test. Collect all range rearing-houses and clean. Clean all surplus laying-houses and fill with pullets. Mate up pens for early table chicks. Purchase stock cockerels and breeding hens. Yearly inventory to be dealt with. Remove turkeys from stubbles. Move laying ducks to permanent quarters.

OCTOBER.—Attend to pullet flocks. Supply winter rations. Light up houses. Watch for autumn colds. Fatten turkeys and geese. Attend to ventilation of houses. Incubate eggs for table poultry. Final selection of breeding stock.

NOVEMBER.—Enquire about turkey prices from prospective buyers. Mate up breeding pens of heavy breeds. Prepare incubators for early hatches. Order any brooding equipment needed. Fatten Christmas chickens. Select and mate egg-laying ducks.

DECEMBER.—Select turkey breeders from young flocks. Mate up geese and table duck breeding stock. Dispose of surplus turkeys. Arrange for supplies of anthracite coal and oil for the season. Incubate eggs for early spring chicken trade.

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